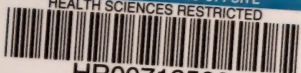


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THE JOURNAL

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MARCH, 1917

No. 1

THE NEW ERA IN DENTISTRY; ITS RELATION TO THE INCREASE IN MALPRACTICE LAWSUITS¹

By BISSELL B. PALMER, JR., D.D.S.

DURING the past four years many efforts have been made to impress the members of the dental profession with the necessity for revising and modernizing their operative technic. Every conceivable argument has been advanced to stir the profession to action along these lines. It has been pointed out that dentists are bound morally and legally to perform only aseptic scientific operations. The probability of higher fees has been advanced as an argument, in the hope that it would stimulate some to better operating. The injuries caused by septic operations have been demonstrated time and time again, in the hope that perhaps a realization of the harm done thereby, might stir some sleeping consciences to action. These and other arguments were apparently interesting to the profession merely as so much dental literature, for they were *not* successful in bringing about the desired amendment. Then our dental authorities as a last resort, sounded the warning, that the day would come when it would be common practice for the public to attempt to exact by process of law, financial remuneration for injuries caused by

¹ Read before the First District Dental Society, S.N.Y., Dec. 4, 1916. See disc. p. 85.

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unscientifically and septicallly performed dental operations. It was felt that the entire profession would respond immediately to such a warning, and would abandon the operative practices which were taught twenty and thirty years ago. While it is true that this alarm repeatedly sounded has panic-stricken some few dentists with the desired result, undoubtedly the great majority of the profession are still practising along the same old lines.

The astonishing apathy shown by the profession as a whole on receiving this warning, can be accounted for by three facts:

1st—The characteristic indifference of our race to the prophecy of any serious event of the indefinite or very distant future. Dental malpractice lawsuits as a common occurrence seemed far away.

2nd—A great many of those who were looked upon as big men in the profession, and who could by accepting the warning have set an excellent example, scoffed at the very suggestion that they could be sued for malpractice. Their high standing made them feel smug and secure. They bragged that their patients were not of the type who would bring suit. Unfortunately these promulgators of false ideas have had plenty of followers.

3d—The fact that although the profession was implored to give up its obsolete practices, our dental authorities had not agreed on what constituted correct dental treatment, and each authority advanced his own ideas on the subject. As many of these theories were very wide apart—no confidence was instilled in the mind of the average operator, and consequently, he saw no reason why he should not continue to practise in the old familiar way, pending future developments.

This lack of concern following the forecasts of possible malpractice suits was so general, that probably not five per cent. of the dentists in this city are even to-day making an honest effort to perform their operations in an aseptic manner.

Recent events have proven the foresight of those advisors who would have saved the profession from what it now faces. The ominous day which you have been warned of so often, and which at the time of warning seemed so far away—is here. Just as prophesied, the public has taken the matter into its own hands, and is instituting legal actions in great number, to recover

damages from dentists for injuries caused, or believed to be caused by faulty operations.

Your essayist is one of those who has seen the development and growth of the malpractice lawsuit evil. He has never spoken to the main body of a Society on the subject, but has warned individual dentists at every opportunity. As an exodontist he was in a position to note the following significant indications of the gathering storm.

1st—The increased number of requests from patients for an opinion as to whether or not certain dental work constituted malpractice.

2nd—The increased number of requests for services, either as a friendly advisor or as a witness for the defendant.

3d—The number of patients who (without the knowledge of their dentists) were having troublesome teeth X-rayed, and were assuming a threatening attitude upon seeing the Roentgenographic findings.

4th—The patient's bitter condemnation, instead of the old-time glorification, of the dentist who insisted on keeping a pus-producing tooth in the mouth for months and months after it was incurably diseased.

Any one of the foregoing observations, in itself, would not have seemed so important, but one such circumstance after another convinced me that trouble was really brewing.

For two years I closely watched the situation and saw it go from bad to worse, and last Spring when a series of lawsuits came to my attention, I concluded that the storm had arrived.

I approached the chief lawyer of one of the liability insurance companies, with the thought in mind that he if anyone could tell me of the real situation. When asked if the statistics of his company substantiated my observations, he replied that lawsuits against dentists for malpractice had increased shockingly and were becoming more common every day. Statements and statistics, since received from four of the largest insurance companies, indicate positively that these malpractice suits have doubled in number in the past three years and are increasing much more rapidly at the present time. To bring the issue right home to you, I submit the information that to my knowledge there are

at this time ten well-known members of The First District Dental Society, who have malpractice cases on the court calendar. In view of the acknowledged fact that professional men sued for malpractice keep the matter as quiet as possible, it is probable that there are a great many other suits pending against our members.

As an indication of the changed conditions, I bring to your attention the fact that the premium on dentists' liability insurance has advanced $33\frac{1}{3}$ per cent. in recent years. Years ago when these liability policies were first written, a dentist ran about as much chance of being sued for malpractice as of being hit by lightning. Now-a-days, the chance of being sued varies directly with the number of patients in a given practice. Furthermore, I have been advised that one powerful insurance company is desirous of binding the other companies to an agreement for a standard premium of twenty-five dollars for dentists' liability insurance. The inference we may draw from all these facts is, that the number of malpractice suits compared to the number of policies issued, has reached such a point that the insurance companies have found it necessary to raise the premium. I am informed that this step was taken not to make the business more profitable, but so that the losses would not be so heavy.

These facts are presented to convince you of the size to which this lawsuit evil has grown. The ten men referred to who are now being sued, all practise in the area bounded by Fifty-ninth Street and Thirty-eighth Street—Broadway and Madison Avenue. In the ten practises, there are as patients some of the richest and best-known men in the entire world, proving that no dentist is exempt from the lawsuit menace, regardless of where he practises or whom his patients may be. A serious situation exists and no one knows which of us is to be the next victim.

For every effect there must be a cause, and there are six principal causes for the recent growth of malpractice lawsuits. Before proceeding to a consideration of these, let us first look into the great underlying cause of nearly all the suits.

I shall quote to you a statement from the lawyer of a liability insurance company, which bears directly on this phase of the

situation. "I incline to the belief that the first, principal and most prolific source of malpractice suits, whether dental or medical, is unguarded, unwise, and self-serving statements made by members of that profession."—"Actions against dentists to recover damages for malpractice cannot be successfully prosecuted without the aid and testimony of some dental expert for the claimant. The case would not be prosecuted if it were not for the assistance and testimony given to the plaintiff by members of the dental profession, sometimes openly and other times not."

Thus a lawyer, an expert in his specialty, tells us that we ourselves are responsible for the predicament we are in. My own observations bear out the testimony of this lawyer to the last word. In practically every dental lawsuit I have been acquainted with, there has been either a dentist or a physician whose criticism of the work gave the patient the inspiration to bring suit. Almost every one of these suits could have been side-tracked by just a little fairness on the part of these advisors. There were two cases last year in which the defendant was a member of The First District Dental Society, and the principal witness and only support of the plaintiff's case was also a First District Society member. There are two cases now on court calendars for trial in which the same circumstances exist. This indictment of the members of the dental profession by one of the legal profession is thus substantiated by your essayist, and can be further corroborated by any other dentist who has studied the situation.

If the legal profession knows, as it does, that 90 per cent. of the lawsuits brought against dentists can be traced to an origin of inconsiderate, selfish remarks of some other dentist, then there is where our first corrective effort must be made. No dentist can conscientiously criticize the work of another in a manner liable to result in a malpractice suit (with its great worry, possible loss of professional reputation, and years of savings) unless he knows all the circumstances and particulars surrounding the original operation.

No dentist can be sure that he is in full possession of all the circumstances surrounding that operation unless he has conferred with the original operator. The version of a dissatisfied patient, while possibly honest enough in intention, is not always, or even

generally, correct. A great many factors must be considered such as: Was the work performed in the time and manner which the dentist desired? Was his patient a neurasthenic, unable to bear the slightest pain and very little in the way of tedious treatment, and yet for whom something in the way of dental correction had to be done? It is a recognized fact that patients who go to a new dentist to have some old work criticized, never tell that the first operator advised strongly against doing that very work. Should not all these side lights be seen before any work is criticized? Do not forget that all the law calls for on the part of a dentist is that he shall exhibit a degree of skill in his work which will compare favorably with the standard practised by the majority of dentists at that time, in the same neighborhood.

Therefore is it not necessary before you condemn a man, that you know the standard in the locality in which he practises? In attempting to set this standard avoid placing it too high—do not imagine that the majority of dental operations performed in a given community are ideal in character, and then judge some fellow practitioner accordingly. Your essayist knows the type of dentistry which is being performed to-day in the best locality in the entire world, and can assure you that its scientific standard is not high by any means. Avoid comparing work done several years ago with the standard being taught to-day. In judging another dentist, by all means do not over-estimate your own ability, particularly in root canal operating. If you do not see Roentgenograms of your root canal operations, and you think your results are perfect, let me assure you that you are living in a fool's paradise. If you have all your root fillings X-rayed, it is unnecessary to warn you against setting the standard in your locality too high. When you read a Roentgenogram of some fellow dentist's work, don't assume a very superior air and say: "Why this canal is only half filled—that's wretched work." What you mean is, the root filling which the Roentgenogram *shows*, does not extend to the apex. Never lose sight of the fact that a root may be filled to the apex with paraffin, or some other agent which is not opaque to the X-rays. In the great majority of cases which show no filling at the apex, there is none, but no dentist and no physician can honestly state, after reading such a

film, that the filling does not go to the apex. He can only say that the negative shows none, and he is duty bound in order to safeguard the dentist who performed the work, to tell the patient that the apex may be entirely filled with a material which would not show in the picture.

If you find a piece of bridgework which is filthy, and detrimental to the health of your new patient, there is no reason why you should not advise the removal of that bridge. What I do object to, and what does start the trouble, are the comments which usually accompany the removal of that bridge. The most common statements are: "It's too bad you didn't come to me first," or: "That's a miserable piece of work," or: "Who on earth put that bridge on." These and similar statements are the means of instigating most of the lawsuits. I will grant that the first duty of a dentist or a physician is to his patient, but I affirm it to be grossly inconsistent for a professional man to save a patient's life with his skilled hands, and then to ruin another professional man's life with his skilled, but venomous tongue.

I do not imply that all poor operating is backed with a good excuse. I do insist, however, that every dentist should, when criticizing, make allowances for the many circumstances which might have a bearing on the result of the work. The Golden Rule was made to apply to just such a situation as this. Criticize the other man's work as you would like to have him criticize your worst work, remembering that your criticism may be falling upon fertile soil, from which a malpractice lawsuit may grow. When you utter your harsh disapproval of some one else's work, realize that you may be starting an avalanche which will sweep away that man's professional career, his health and perhaps the money he has saved for his old age. Furthermore, consistently to practise the Golden Rule in dentistry, you must do the kind of work for your patients which you as a patient would like to have done for yourself.

The six principal causes of the great increase in malpractice law suits are as follows:

First and foremost—The Workman's Compensation Law in this State. The sudden rise in the number of lawsuits can be placed with the date of the practical operation of this law. In

support of this statement is the fact that in every State which has enacted such a law, the same phenomenon has been observed. The law has this effect because it takes away from the ambulance chasing, blackmailing type of lawyer, his most remunerative field of endeavor. In the old days the injured workman as soon as his consciousness returned, was interviewed by this legal scavenger and was submitted a proposition along these lines: "We'll sue for twenty thousand—we'll divide whatever we win—if we loose, it costs you nothing." The compensation law does away with all of this, and now when a workman is injured, he is legally entitled to collect damages from his employer, and the compensation commission decides what shall constitute proper remuneration for his injuries. Thus the black sheep of the legal profession are deprived of their most profitable kind of case, and are forced to seek new fields for the exercise of their talents. What finer field could be chosen than that of dental malpractice lawsuits? There they can get the old blackmailing tactics working again—threaten nasty newspaper publicity and similar steps. They seize every opportunity to encourage the bringing of such a suit. It seems as though every one of these legal buzzards has dozens of relatives, all watching out for possible cases for him. When they hear of some dissatisfied, disgruntled patient, he is notified and swoops down on the prospective case with all the speed and enthusiasm he once displayed in chasing ambulances. So we have uncovered what has been a most powerful influence in causing the present dangerous situation.

Second.—Some of the insurance companies which issue liability policies to dentists are directly responsible for the increased number of suits. The matter of defending a policyholder is not in the slightest degree a sentimental procedure, but is a cold blooded business proposition. Under the policy contract the companies agree to fight the case through the highest court (providing of course the expense involved does not exceed a certain liberal sum named in the contract.) Some of the companies have been guilty of a vicious and far reaching procedure in many of their cases: viz., estimating the cost of defending a certain suit and concluding that it would be quite expensive for the company, they often advise and urge a settlement with the plaintiff, on the basis

of a sum less than it would cost them to defend the action. A well scared dentist worried sick and sleepless, has hardly the vigor to insist upon his contract rights which call for a fight to a finish, particularly if the lawyers shake their heads mournfully when asked for an opinion regarding the probable outcome of a trial. The natural inclination is to grasp the easiest way out,—no publicity—no trial—no grilling on the witness stand and no more worry. All this generally proves too strong a temptation to resist, and the dentist yields to it. The effect of this procedure, repeatedly practised by some of the companies, is apparent. It gives that buzzard lawyer previously referred to, further encouragement in his activities. He can be sure, that in as much as a great many of the dentists carry liability insurance, almost any action instituted against such a dentist, regardless of his professional standing, financial condition, or the strength or weakness of the case, is apt to result in a settlement of at least a few hundred dollars. The subsequent bragging on the part of both the lawyer and his client, allows thousands of people to learn of a new and easy way to pick up some money. I do not contend that this settling policy has been practised by all the insurance companies—on the contrary, I believe that only a few are guilty of it, but it is a fact that the method has been practised commonly enough to warrant condemning it as one of the real, live causes of the present deplorable situation.

Third.—The development of X-rays in dentistry is undoubtedly a great factor. There was a time and we all know it, when the septicly filled root canal, the perforated root, the broken off broach or bur in a root and their resultant abscesses, could be explained away by a dentist's sympathetic and nonchalant statement of, "That's just a little cold which has settled in your tooth, Mrs. Jones," or "just a little gumboil, Mrs. Smith." Those were the happy-go-lucky, carefree days of dentistry, which are no more. Our patients have developed an insatiable curiosity. Today patients have their troublesome teeth X-rayed (without the dentist's knowledge far more often than any of you suspect.) A black and white film and its cold blooded expert interpretation by a specialist, is frequently most exasperating to the patient, and sometimes leads to a legal effort for reimbursement for work

poorly done, or some unfortunate systemic ailment believed to have resulted from it. The dental Roentgenogram is the greatest asset to a plaintiff and is always accepted by a judge and jury as strong evidence, particularly when expert interpretation of it is offered as testimony at the trial.

Fourth.—The extensive publicity given to the results of recent dental and medical research, in the field of systemic diseases caused by dental foci of infection. This publicity has been achieved through the popular magazines and the supplements of Sunday newspapers. The articles are generally written by a layman with scant knowledge of the subject, to excite wonder and amazement in the lay mind. A credulous reader may easily gather the impression from one of these articles, that the only reason why he cannot look forward to perpetual life on this planet, is because some day he will succumb to a disease caused by septic dentistry. The general public is already quite excited on this subject, and can be heard discussing it almost everywhere. Word is being passed from one to another, that perhaps that long standing case of rheumatism or heart trouble is due to some obscure dental abscess. There are many thousands of arthritis and endocarditis cases in New York City and probably a majority of them have received some dental treatment. They are all hearing of the new theory on the subject. In every thousand there are always a certain number who will accept eagerly any opportunity for monetary gain, regardless of the method to be used. Thus, the influence of these articles with their malformed conception of the subject, must be considered with the other causes of the increase in dental law suits.

Fifth.—The growing tendency of dental operators to overestimate their ability along special lines. For instance, a dentist of average ability and experience, attempts the extraction of a deeply buried impacted third molar, or the treatment of a most difficult case of orthodontia, or takes some other operative risk which he has no moral right to assume. The inevitable failure of the operation is splendid opportunity for the beginning of a malpractice suit, should the patient or the patient's relatives be so inclined. This rash operating is the one disadvantage to postgraduate instruction along special lines, for while the

instruction given may equip a dentist to perform simple operations of a special nature, he frequently gathers the impression that he can operate anything and everything which the post-graduate instructor lectured upon.

Sixth.—The fact that dental practice and technic have been revolutionized in the past few years. The leading scientists in our profession have given us a new standard of dentistry. The public is well aware of the change. The profession, excepting a very small percentage, has failed to adopt the new standard and theories. Consequently, a layman educated up to the minute on the ideals of modern dentistry, visits a dentist to receive professional services based on those ideals, and receives instead, operative services which embody the thought and practices of fifteen to forty-five years ago. That a certain number of disappointed and disgusted patients should attempt to recover damages for injuries caused by this antiquated dentistry is not surprising. Undoubtedly some suits of this nature are brought, not for the gain of money, but in the sincere belief that other dentists, hearing of them, will change their methods.

To summarize—the principal causes of the increase in dental lawsuits are: 1st—The enactment of the Workingman's Compensation Law. 2nd—The development of the X-rays in dentistry. 3d—The policy of settling, rather than fighting of suits by insurance companies. 4th—The publicity given to recent dental and medical research. 5th—Over-estimation by dentists of their ability to care successfully for difficult cases. 6th—The failure of dentists generally to govern their practices according to the teachings of the day, particularly in regard to asepsis.

The stamping out of this lawsuit menace is within our power as individuals and as a profession.

As an organized profession we should, with the aid of the medical profession in this State, attempt to procure legislation which would protect us to some extent from the blackmailing type of lawsuit.

With that end in mind, I recommend that we strive to have passed in this State a law which will make it necessary for a plaintiff before beginning action, to give a bond sufficient to cover the trial costs.

Such a law would tend to act as a brake on the type of plaintiff who has no real cause for damages, who has no desire to carry the case to court, and who merely tries to scare the dentist into making a settlement. Should such a plaintiff have to put up real money as the first step in the procedure, with knowledge that should he lose the decision he would lose his money, he would go over his case pretty carefully and if it failed to show strength, probably he would never start the action.

What practical steps can we take as individual dentists to crush out this evil? We must divide the suits into two classes:

First.—The case of a plaintiff who has suffered an undeniable and inexcusable injury as the result of improper dental services knowingly performed. The principal and most effective precaution to take against such a plaintiff, is so to govern your practices, and to perform your services for your patient, that the institution of such a suit will be practically impossible and easily defended. Operate in such a manner, that an expert witness taking the stand in your defense, can testify under oath, that each and every step of the operation was properly performed.

Second.—The plaintiff who is merely seizing what appears to be a favorable opportunity to extort some money—Blackmail! There are several steps to be taken as precaution against this type of case. First, by an explicit understanding beforehand, always make your patient take full responsibility for the result of any operation in which there is any question as to the successful outcome. Inform your patient that you will perform the services to the best of your ability, but that neither your best services nor the best services of anyone else, can positively and unquestionably achieve the result which is desired.

Always keep complete records. An eminent legal authority writes me to this effect: "We have been seriously handicapped in the defense of many cases where the defendant has no record or an incomplete record of the case." Keep note of every step of treatment you employ in every case. Don't take a chance on being called to the witness stand in your own defense, and having the patient confront you with charges regarding certain phases of your work, and find yourself unable truthfully and effectively to deny those charges, through lack of a complete record of the case

which you can submit as evidence. Even though you should remember every detail of your work for the plaintiff, the jury will not believe you, for they will be unable to conceive of a busy dentist remembering all the details of all the work, which he performs for all of his patients.

I have received from some of the insurance companies statistics which, when adjusted in accordance with the dental viewpoint, indicate that between 30 and 40 per cent. of these lawsuits are based on the extraction of teeth—and between 50 and 60 per cent. are based on faulty root canal work. Lawsuits arising from causes other than these are almost impossible to classify on account of their great variety. The most common, however, are injuries caused by arsenical necrosis, slipping instruments and drug burns. Suits based upon secondary infections resulting from a dental focus are not numerous yet, due to the fact that public education along this line is still young, and while there may be many of these suits in the wind, they have not had time to get into the statistics.

The most common specific grounds on which the lawsuits arising from extractions are based, are as follows: Incomplete extractions, fractures of the maxillae or alveolar process, injuries to soft parts, injury to an adjacent tooth, operative infections and extension of preëxisting infections.

The extracting field of course presents no end of opportunities for legal troubles. Danger of accidental injury is always present, due to the very character of the operation. We remove by force a dense ivory-like body, so formed by nature as to resist dislodgment, from a dense bony structure surrounded by soft tissues, vessels, nerves and oftentimes weak-walled or porcelain adjoining teeth.

Any operator, regardless of his skill (and all skilled operators know this), may achieve a result in the extraction of a tooth which his patient may consider malpractice. The law requires that we all take every possible precaution against accidents, and if we do, and in spite of our precautions accidents happen, then in the eyes of the law, a dentist is not liable (although juries frequently cannot see the law in that light). Therefore it behooves us all to know what precautions to take and to take them. The

technic in detail for extracting operations would be worthy of a book by itself; accordingly, I shall in this limited time merely suggest some ordinary precautions, the practise of which may be the means of preventing a suit.

The governing maxim in extracting should be: "Exert the maximum of patience and perseverance, lose no time, but don't hurry."

You must observe the strictest surgical asepsis in all mouth operations.

If a small apex is broken off a root which is *not* infected, and it appears that the destruction of tissue necessary to the removal of that tip end would not be justified, explain the situation to your patient and put the matter up to him, stating your willingness to remove the remaining tip but that in your opinion it would not be wise to do so. If your patient accepts your advice, sterilize the socket with iodine and dress with iodoform gauze for a few days. Advise a Roentgenogram every four months, and also a report at any time of discomfort. If you are dealing with a patient of the neurotic type who would never cease worrying about such an apex, it would be proper to explain the situation to a relative. The law does not insist upon special skill and therefore, if it seems advisable to remove the apex, and it looks as though it would be a difficult operation, refer your patient to a specialist. If you attempt and fail in an operation for which you are not equipped either in instruments or experience, then you do become liable under the law.

Do not guess as to which tooth is to be extracted. Insist upon your patient indicating it to you, you in turn describing its appearance and position, if necessary using a hand-mirror.

Examine the mouth carefully for porcelain and other frail teeth. If the teeth are closely set in the arch, and a frail tooth is adjoining the tooth which is to be extracted—point out the danger of injuring the frail tooth, expressing your intention of taking every precaution, but make your patient understand that you will not be responsible for any damage done. If the type of patient seems to warrant the step, secure a written release before operating.

Always know exactly what you are moving with your ex-

tracting instruments—watch the adjoining teeth—keep the beaks of your forceps parallel with the long axis of the root. Do not dive down with your forceps into a mouth full of blood and saliva, and grasp—just something—trusting to luck that you are getting what you started after. This excited form of blind operating is responsible for many accidents and injuries.

Always respect and protect the soft tissues. Should you accidentally lacerate them, trim any ragged edges with surgical scissors, sterilize with iodine, and if necessary to keep the edges in position, pack lightly with 5 per cent. iodoform gauze.

It is important to curette every socket following the extraction of an infected tooth, for it is just as necessary to remove the pyogenic membrane as it is to extract the diseased apex.

Remove all crumbs and any broken sections of process. Use iodine freely and pack a socket lightly with gauze if you fear premature closing of the orifice.

A severe soft tissue infection—a cellulitis—should not be treated by a general practitioner, unless he has had an extensive experience in treating such cases. They are serious, frequently dangerous and should be treated by a specialist. However, if for any reason which may seem fitting, an inexperienced practitioner should attempt the treatment of such a case, a few general suggestions given here may help in clearing up the infection and in protecting that dentist from legal complications. First, apply iodine to the entire operating field, remove the tooth producing the infection, curette lightly, lance the abscess if inside the mouth, and if sure you will get pus, again apply iodine and insert 5 per cent. iodoform gauze dressing. Prescribe a physic to maintain a constant eliminating process—maintain periodical ice bag applications as long as the swelling is under control. See your patient at least once daily and watch carefully for any changes in temperature. If the temperature rises and you are not making headway against the infection, put the case either in the hands of an oral or a general surgeon. In the very beginning of such a case, impress upon your patient the fact that extracting the tooth merely removes the cause of the infection, and not the infection itself, which must be treated afterwards as a separate, though related condition. Allow your patient to understand that while you will

make every effort to avoid making an external incision for drainage, some dental infections must terminate that way. Do not scare your patient half to death, and yet do not make so light of the condition that he will underestimate the seriousness of it. Frequently it is easier to be perfectly frank with responsible relatives rather than with a worn-out patient.

Tell every patient for whom you do any extracting to return to you for inspection and possible treatment.

In operating under nitrous oxid and oxygen, have your assistant pack the back of the mouth with a gauze pad with string attached, to prevent flying pieces of filling material or tooth from getting into the air passages.

It is certain that from the very nature of the work, if a dentist does enough extracting, he is bound to run into trouble occasionally. I believe, however, that a careful observance of the suggestions given will reduce the risks to a minimum.

Unsatisfactorily performed extractions and root canal operations are the two most frequent causes of dental lawsuits. We have reviewed the principal dangers of the former, and the precautions which it is advisable to take in order to avoid those dangers.

Lawsuits based on faulty root canal work can be listed under a number of headings: broken broaches and burs, root perforations, local infections (chronic and acute), septicemia, secondary infections, etc., and these compose from 50 to 60 per cent. of all lawsuits. When we consider that extractions form a basis of from 30 to 40 per cent. of suits, and that a majority of extractions are necessitated by unsuccessful root treatment, we can charge up that unsuccessful treatment, directly and indirectly, with perhaps 80 per cent. of all lawsuits. These figures show the importance of a very close study of the root canal situation as it has existed, and as it exists to-day.

Until about five years ago an average dentist treating and filling the canals of a tooth, considered that he had performed his duty when he had removed all the canal contents which could *easily* be removed, from all the root canals which could *easily* be found. He dressed the canals with cotton and phenol, or some other anti-septic, then sealed the cavity with cotton and sandarac varnish.

After several days (or perhaps several weeks) of similar treatment, if the tooth became comfortable, he filled the canals he had found as nearly to the apex as he *easily* could. Most practitioners depended upon some proprietary mummifying paste, to keep dormant any sections of the nerve which had not been removed. Nearly all dentists considered that they were fulfilling every obligation to their patients, and were maintaining the highest ideals in dentistry, by keeping every tooth in the mouth for masticating purposes as long as it could be kept there in a reasonably comfortable condition.

About five years ago the X-rays opened the eyes of the dental profession to the type of root canal work it had been doing, and the septic areas caused by that work. At about the same time Hartzell, Grieves and others showed us that secondary infections could result from the establishment of such a septic focus. Very few men accepted these statements seriously. The topic was adopted, however, as a basis for banquet jokes by some of the prominent men of dentistry. Most dentists argued, that patients would not stand the expense incidental to prolonged and thorough root canal work; that busy dentists couldn't fool around with the X-rays—it was a fad and dangerous anyway;—that many of their patients who had devitalized teeth in their mouths were walking around town without a limp, an ache, or a pain; that for twenty-five years they had been doing the same kind of root canal work and had not seen any abscesses resulting from it; on and on they prattled. Only a few months ago I read in a journal of a State Dental Society, an essay on this subject. The writer took exception to the present day ambitions in root canal technic and advocated and described his own highly successful treatment. In a few words, it consisted in getting out as much nerve material as he could without being too fussy and then depending upon Ox-para to do the rest. He stated that he had practically no septic trouble following such treatment.

There are three reasons why dentists do not see the septic results of such unscientific treatment of root canals.

1st. The patients who do have trouble, frequently visit another dentist for further treatment—or more likely, have the tooth extracted.

2nd. It is possible for a tooth to remain perfectly comfortable, exhibit no external symptoms of sepsis and yet have a large diseased area over its apex.

3d. A certain very small percentage of devitalized teeth treated in this manner show no septic symptoms—undoubtedly due to the high resistance of the patient, and to the fact that a walled off section of pulp may remain vital in the apex.

In the past five years there have been comparatively few dentists converted to the new ideals and standards of dentistry. It is a fact that the great majority of dentists are still merely restorative artists, who are conscious of no responsibility to their patients beyond keeping the teeth comfortable, and repairing or replacing them to restore the function of mastication.

As previously stated, one of the principal reasons for the scarcity of converts to the new dentistry, has been the lack of confidence of dentists generally in the leading authorities and teachers of our profession. One authority has told us to do this—another to do that—a third to do neither, and so the average practitioner, having no confidence in any one man and his teachings, has practised in the same old rut.

As a profession we have reached a cross-road: We lack confidence to take any step ahead fearing that it may be one in the wrong direction. Yet as members of a profession destined to serve mankind we cannot stand still! We must go on! These cross-roads are imaginary, not real. There is but one road for us to choose, and that the one in which we can best safeguard the health of those who put themselves in our hands for dental treatment.

In an effort to indicate that road, your essayist has composed a series of questions concerning problems of dental practice and technic, and submitted them to several prominent members of the profession. Answers have been received from Doctors Elmer S. Best, William P. Cooke, William B. Dunning, Henry W. Gillett, Thomas B. Hartzell, Percy Howe, C. Edmund Kells, Arthur Merritt, John E. Nyman, William H. Potter, Meyer L. Rhein, Eugene H. Smith and William D. Tracy. Some of these men are famous as dental investigators, others are prominent as leading advocates of the school of so-called "conservative" den-

tistry, while still others are well known exponents of the newer thought in dentistry. Six of those to whom questions were sent, either because of illness or unwillingness, have failed to answer.

It is a fact fully appreciated, that there are many in the profession in addition to the gentlemen named, who are well qualified to answer authoritatively the questions propounded; but for obvious reasons it has been necessary to avoid extending the list indefinitely.

I shall not attempt to lay down any hard and fast rules of operative technic, for it is a recognized fact that nearly all principles and rules permit the occasional exception; nor shall I presume to define what does or does not constitute malpractice; but I shall offer for your consideration a series of conclusions presented not as the last word on the subject—only the latest.

These conclusions are based on:

- 1st. A careful study of the answers received from the dentists previously named. (It is but fair to state at this point that it is not expected that all these gentlemen will agree in every conclusion I have reached.)
- 2nd. A study of the scientific findings of Best, Billings, Hartzell, Grieves, Noyes, Ottolengui, Rhein, Rosenow and others.
- 3d. The examination of many thousands of extracted teeth and a knowledge of their clinical histories.
- 4th. The reading and study of hundreds of dental X-ray negatives.
- 5th. The bacteriological examination of the extracted teeth of approximately one hundred patients suffering from arthritis, endocarditis or some other condition believed to have its origin in a dental focus of infection.

CONCLUSIONS.

- 1st. *Strict surgical asepsis must be maintained in every step of every root-canal operation.*

That arthritis and endocarditis are often caused by a dental focus of infection has been theoretically proven, and the clinical evidence in support of the theory is so strong and so extensive, that it should no longer be doubted.

Dr. Thomas B. Hartzell states, "That secondary infections of the heart, joint and kidney, can and do occur from primary tooth neighborhood infection is not a theory; it is an absolute fact which will never be disproved."

The new standards cannot be used as evidence to prove that operations performed in the past constituted malpractice; but all dental practices should be conducted in the future along lines which will guard against the *possibility* of secondary infections arising from a primary dental focus.

2nd. *The pulps of teeth should be kept vital as long as possible.*

The serious results which may follow the devitalization of a tooth, warrant the condemnation of the wholesale pulp removal practised by many dentists.

Restorations which necessitate the devitalization of sound teeth should be contraindicated by that fact.

In the adult tooth when the zone of partially decalcified dentin reaches the pulp without actually exposing it, an effort should be made to preserve that pulp. A method of treating such a tooth which meets with general approval is as follows:

Excavate the disintegrated dentin as thoroughly and carefully as possible in every direction except that which would immediately expose the pulp. Sterilize with phenol or 10 per cent. silver nitrate. Thoroughly dry the cavity. Many of the men questioned cover the point nearest the pulp with zinc oxid plus Eugenol or Oil of Cloves. Without pressure fill the cavity with cement, Oxyphosphate of Zinc generally being used.

Dr. William Dunning advocates putting the tooth on trial for two months, and if at the end of that period its condition warrants the step, he cuts away the superficial parts of the cement filling, leaving the deep part intact, and inserts the permanent filling.

Dr. Percy Howe decries the use of strong, irritating anti-septics for sterilizing such a tooth, and advises the use of the powder of copper cements, mixed with dilute potassium iodid.

Dr. Henry W. Gillett places more dependence upon thorough drying than upon the application of any medical sterilizing agent.

Dr. Arthur Merritt, in treating a tooth with pulp not quite exposed, after sterilizing, advises varnishing the cavity with a

preparation made from commercial zinc oxid c. p. and gum damar, equal parts, made soluble by the application to it of a pellet of cotton saturated with chloroform.

It is the consensus of opinion that such a tooth should be tested for vitality every six months; also, at any time when the tooth becomes uncomfortable. Many advise a test every three or four months.

The tests for vitality most commonly advocated are:

By heat—A small hot pellet of gutta percha on the end of an instrument.

By cold—The ice pencil or ethyl chloride spray.

By electricity—Either galvanic or faradic current.

Before testing any tooth for vitality it should be thoroughly isolated.

Drs. Elmer Best, Arthur Merritt, William Cooke and M. L. Rhein devitalize any tooth where the area of infection from decay reaches the pulp.

3rd. *Vital teeth should not be crowned with the commonly used full length gold crown, and devitalized teeth should not be so crowned if it is possible to make the restoration in any other manner.*

This filthy, unscientific, irritating relic of the birth of dentistry, should be abandoned.

4th. *When the X-ray discloses a pulpless tooth, the root canal of which is but partially filled, but where no sign of local or secondary infection is indicated after years of comfort, we are justified in allowing that tooth to remain undisturbed. However, if an extensive filling operation is contemplated, or if the tooth is to be used as a bridge abutment its root canals should first be thoroughly opened, sterilized and correctly filled.*

Dr. Rhein believes such a tooth should always be opened and refilled.

5th. *Indefinitely prolonged unsuccessful treatment of infected teeth is the shame of the dental profession.*

In ninety-five cases out of a hundred a tooth which continues to generate pus after a week of correct root canal treatment will continue to do so until the tooth undergoes either apicoectomy or

extraction. Any tooth afflicted with pyorrhea which continues to exude pus after a month of correct treatment should be considered hopelessly diseased and should be extracted.

Dr. Wm. P. Cooke states: "We need the removal of multitudes of diseased teeth that have been kept by the patient for looks only and by the dentist for revenue only."

6th. *Arsenic as a pulp devitalizing agent is uncontrollable, inaccurate, unsafe and should not be generally used.*

In response to a question regarding the best means of extirpating a vital pulp, Dr. Henry Gillett has given an answer which is complete, and which represents a consensus of opinion of all the answers received in reply to that question. Dr. Gillett's reply is as follows:

"Conductive anesthesia, infiltration anesthesia or intraosseous anesthesia, according to the condition of the case; pressure anesthesia, either with pure novo-cain or cocain-hydrochlorate; refrigeration.

"Technic: Conductive, subperiosteal and infiltration anesthesia as taught by Fischer, Schamberg, Thoma, Vaughan and Blum, with particular attention to asepsis of each step.

"Intraosseous anesthesia as practiced by Clapp of San Francisco with even greater aseptic precaution.

"Subperiosteal and infiltration anesthesia is reserved for the occasional case in single rooted teeth, but is sometimes needed to supplement conductive anesthesia in the superior bicuspid regions.

"All actual work on the tooth itself in pulp cases, to be performed with the rubber dam in place and subject to a thorough saturation of the cavity and all exposed surrounding parts with some strong sterilizing agent like equal parts of phenol and thymol (or with tincture of iodine), followed by alcohol and the warm air blast. No non-sterile instrument or material should be permitted to touch the cavity, or its immediate surroundings after this step has been taken.

"With these precautions, the published technic of Callahan, Rhein, Best or Ottolengui should be carefully followed. The whole effort should be to establish asepsis and maintain it. There should be no need for leaving strong antiseptic preparations in

the tooth. A surely aseptic dressing is necessary and it should be securely sealed.

"For pressure anesthesia, place a small quantity of novocain (equal to the head of a No. 9 or No. 11 round engine bur) on the point of exposure, after cleaning cavity very thoroughly, soak the walls with phenol and thymol or some other active germicide, add a half-drop of sterile water, place sterile wax or gutta percha over the application and gradually apply pressure, preferably with large ball burnisher or similar instrument. Fold in the wax or gutta percha and repeat until pain is no longer noticed as a result of the pressure. Because of the risk of forcing septic material and bacteria into the circulation, this long used and favorite method is somewhat in disfavor in cases which involve a septic cavity.

"Refrigeration is fairly successful in teeth with small pulps like upper lateral incisors."

7th. *It is highly desirable to open the canals of a newly devitalized tooth to, but not through, the apex. When impossible to accomplish such opening, apicoectomy should be resorted to if feasible.*

Dr. Rhein believes that in a case of this sort, if apex amputation is impracticable, there should be no compromise—the tooth should be extracted. I cannot agree with Dr. Rhein, for I feel that apicoectomy as a practical procedure is so limited in application, that the acceptance of his views on this point would result in the wholesale removal of molars. I agree that extraction in such a case is the only *absolutely* safe course, but there is an alternative which is so safe, that I believe we are justified in resorting to it. In the case of a newly devitalized tooth, if the operator after conscientious effort finds himself unable to open all the canals to the apex, and if apicoectomy is impracticable, he should advise the patient of the situation and explain the risks of retaining the tooth under those circumstances. If the patient by an explicit understanding accepts the responsibility for the step and agrees to have the tooth examined by X-rays periodically: if strict asepsis has prevailed through every step in the technic, then the canals may be filled as completely and thoroughly as the existing conditions will permit.

Any such tooth should be immediately extracted subsequently, if a Roentgenogram indicates the slightest rarefaction above the apex, if the tooth becomes painful, or if the patient becomes afflicted with any systemic disease which might be caused or influenced by a septic tooth; and the patient should be instructed accordingly. Full notes should be kept on the record card in all these cases. A tooth with an infected apex and an impenetrable canal should never be treated in the manner just suggested. It should always either have its apex amputated or be extracted. In answer to the question regarding the technic in opening up difficult root canals to their apices, Dr. William D. Tracy has given a thorough, comprehensive answer. Dr. Tracy's answer is presented because it is the most complete answer received, and because it is similar in principle to the other answers.

(A) "Difficult canals are opened by first cutting away sufficient of the crown so that perfect access to the canal is gained.

(B) "Solium and potassium paste is used; and the course of the canal is followed at first with fine, smooth canal bristles.

(C) "Fifty per cent. sulphuric acid is then pumped into the canal, using the Young canal instruments to enlarge the calibre of the canal. The sulphuric acid is now neutralized with a solution of sodium bicarbonate, which causes effervescence and boils debris out of the canal. The cycle of chemical disintegration and mechanical enlargement of the calibre of the canal is then repeated, proceeding with larger instruments as the work progresses, until the canals are sufficiently enlarged to permit of the proper placement of the root fillings.

(D) "I use beechwood creosote on paper canal points for temporary dressings between sittings, and seal them in with base plate gutta percha. I know that some of our best authorities say that any escharotic drug is contraindicated, but clinical observation leads me to believe that creosote has marked value as a cleansing and soothing dressing in canals."

The broaches most commonly used by other men aside from those mentioned by Dr. Tracy are—Twentieth Century Pathfinders, Rhein or other canal picks, Dayton Barbed Improved Broaches, Kerr reamers and Gates-Glidden drills.

As to the method of maintaining asepsis in canals between

treatments, it is agreed that the canals must be absolutely sealed by a cement filling between treatments. Some men dress the canals with beechwood creosote, some with cresol and others with eugenol or oil of cloves.

8th. *Ionism at the present time does not enjoy universal confidence as a standard positive sterilizer in every case.*

It apparently is giving results in certain cases, but only time will conclusively demonstrate its real value. Most of the dentists questioned are using ionic medication in their root canal work at the present time, or intend installing an apparatus immediately. I believe the evidence of the results so far seen, warrants the recommendation of ionism, in selected cases, with great conservatism.

9th. *After a root canal is traced to its apex, it should be enlarged only enough to make the filling of it possible—not easy.*

Excessive enlarging of canals is chargeable with many of the failures in root canal procedure. Dr. Tracy considers the canal enlarged sufficiently to fill, when it permits the passage of a "fine S. S. White barbed broach," and Dr. Dunning passes freely to the apex a "medium Donaldson broach."

10th. *Gutta percha in chlorapercha is the best root-canal filling material. It is manipulated easiest, it is well tolerated by the tooth structure, and it is opaque to the Roentgen rays.*

11th. *Encapsulation of apices should only be practised with the greatest care and discrimination. There seems to be nothing to gain by the encapsulation of the apex of a newly devitalized tooth. In such a case it probably does more harm than good.*

In the case of an apex which has lost a minute portion of its pericementum, it is quite possible that *true* encapsulation may be a protective measure, in that it would seal the multiple foramina. However, time will decide the wisdom of this procedure, and it is my opinion that results of research of the future will force us either to apicoectomy or extraction in these cases, (particularly when the loss of the apical pericementum is at all extensive).

In the case of a septic tooth, with its apices merging into the

floor of the antrum, root-canal treatment and apicoectomy are contraindicated and the safest procedure is extraction.

12th. *Posterior to the second bicuspid of the superior maxilla and the cuspid of the inferior maxilla, the prospect of a successful apex amputation is so slight as to contraindicate the procedure.*

However, in the most carefully selected case in the hands of a highly skilled and experienced operator, the apices of the buccal roots of a superior first molar, or the apices of the lower bicuspid may be amputated, with a degree of success. It is *physically possible* of course, to amputate the apices of any tooth in the arch, but the width of process, the depth of the apex, the length of the healthy portion of root, the strength of the attachment of the root, the proximity of vessels, nerves and sinuses, the amount of probable tissue destruction and the general operative accessibility, are factors which should be carefully considered in determining the prognosis of any contemplated apex amputation.

13th. *The X-Ray apparatus is indispensable to correct root canal operating.*

An initial Roentgenogram should be made of *every* tooth requiring root canal treatment. One should be taken to show the completed work, and as many intermediary exposures made as may be necessary for guidance during the work.

We know the serious systemic results caused by improperly filled canals. There is no way of ascertaining the thoroughness, or lack of it in root canal operating unless we use the X-Rays. *Thorough and scientific root canal results are dependant as much upon the X-Ray apparatus, as upon the instrument sterilizing apparatus.* Heretofore, root canal work has been classified generally as either "ordinary" or "fancy," but from now on we should tolerate no classification of root canal work other than "correct" and "incorrect." No Doctor of Dental Surgery deserving of that degree, will ever begin any operation, when he knows beforehand that he has not the necessary apparatus (whether it be sterilizing or Roentgenographic) to enable him correctly to perform that operation.

14th. *Insufficient remuneration is not acceptable as an excuse for improperly performed dental operations.*

The economic problem is a separate issue and has no relation to the question of proper or improper dentistry.

Dr. Rhein states: "There is never *any* excuse for performing an operation which is liable to produce endocarditis and other deadly diseases."

The public has already been well educated to the new ideals of dentistry, but it has no conception of the cost of obtaining dental services governed by those ideals.

Patients must be educated to the fact that a devitalized tooth or one requiring devitalization cannot be "saved." The term "saved" applied in this manner is misleading and dangerous. Such a tooth can merely be *retained*. It can be retained only by a series of complex, tedious operations, requiring hours and hours of intense concentration of a skilled operator, and a vast assortment of expensive instruments and apparatus (which in the very near future may have to be augmented by bacteriological facilities). The ordinary appendectomy is child's play compared to the correct treatment of a multi-rooted pulpless tooth. Patients must be educated to a realization of this fact, and forced to understand that they must keep vital the pulps of their teeth; *for the retention of a pulpless tooth, necessitates an operation, which under our present day standards must be considered a luxury.*

Dr. Merritt states: "Every dentist whose time is not all filled should be willing to take such cases at any fee the patient may be able to pay, up to the point where his time is fully occupied. He should be willing to work for any fees, however small, rather than be idle as a result of fees which relatively few in the community can afford. The busy dentist, whose time is all filled, should be able to refer such patients to those less busy."

15th. *Prevention is the solution of the dental troubles of mankind.*

Patients with our help must prevent decay.

Should decay occur, it is the duty of the dentist to prevent its effects from endangering the health of his patient.

He may accomplish this in four ways:

- 1st—By making every effort to keep the pulp vital—(failing in this),
- 2nd—By scientific treatment of the root canals. (If for an economic, or any other, reason this cannot be done),
- 3rd—By considering immediate apex amputation. (If this be impracticable),
- 4th—By advising immediate extraction. (Except in the case of a newly devitalized tooth,—when the alternative previously suggested may be practised.)

So, your essayist has attempted to indicate the manner in which dentists can best safeguard the health of their patients; and also, the manner in which dentists can best protect themselves against the malpractice lawsuit menace.

If this paper accomplishes its purpose in the slightest degree, I shall feel that the energy and the hours put into it were well spent.

In closing, I wish to express my appreciation to those who answered my series of questions. Drs. Tracy and Gillett deserve my thanks, for having assisted in getting my set of questions before several gentlemen whom I had not the pleasure of knowing personally.

I am particularly grateful to Dr. W. B. Dunning, our President, for his constant encouragement. I thank you all for being so patient.

40 E. 41st Street, N. Y. City.

IMMEDIATE TREATMENT OF GUNSHOT FRACTURES OF THE JAWS¹

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THIS paper presents a *résumé* of the methods and appliances used at the 20th General Hospital; it is limited to the discussion of the subject in a general way and to the daily routine of treatment, and because of limited space does not include many of the valuable appliances used by other men.

Nature of Injury.

Jaws fractured as a result of traumatic injury as seen in civil life, present quite uniform symptoms and appearance, and need not enter a discussion of fractures resulting from gunshot wounds, which show great variations in symptoms, with nearly always the possibility of additional complications.

The amount of injury inflicted by a missile is the combined result of its speed, shape, and the angle at which it strikes the parts, and it is difficult to formulate any rules which will fix a definite relation between the size of external wounds and the injury to bony tissues.

Injury to Soft Parts.—If the foreign body causing the injury is a rifle-bullet or a comparatively small piece of shrapnel, and strikes the soft tissues at about a right angle, the wound of entry will be small, and the wound of exit, if present, will be small or large in proportion to the amount of bony tissue the missile has encountered in its course. When the foreign body strikes the soft tissues obliquely or at such a point as will cause extensive injury to the bones, resulting in fragments acting as secondary projectiles and spreading with almost explosive violence, the wounds of exit are in a corresponding degree enormously increased in size.

Actual destruction and loss of the soft tissues is quite uncommon, and the torn and separated borders of very large wounds

¹ Reprinted from *The British Dental Journal*.

can usually be traced. The exaggerated size of the wounds is due to the contractile powers of the tissues, the inflamed condition to injury and the infection of organisms from the mouth or other source, and the displacement of the fragments of the jaws which tend to pull open the wound.

Injury to Bony Tissues.—Fractures of the jaws or bones of the face in the direct course of the missile are compound and comminuted, though other simple or compound fractures of associated parts may exist as the result of the transmitted force.

The injury to bony structures may be slight, as in cases where the teeth and alveolar process are involved without affecting the continuity of the body of the bone; or severe, as in cases of multiple fractures of the maxillæ, often with accompanying fractures of the bones of the face; or severe, as in cases in which there is a loss of bony tissue in one of the maxillæ, or in the face.

General Condition of the Patient.

From first-hand evidence we learn that many soldiers, when wounded in the jaws do not lose consciousness, but are able to take care of themselves to the extent of stopping hemorrhage, and even walking some distance in many cases to have their wounds dressed. When they are found unconscious and bleeding freely, they receive the field-dressing, and are sent along to the base hospitals within from two to four days. Their wounds are always septic and inflamed. Even the slightly wounded show signs of weakness and fatigue. The seriously wounded are very ill, undoubtedly due to the combined effects of extensive inflammation, the loss of blood, the inability to eat properly and the painful effect of the injury, combined with a certain amount of mental shock and an abnormal temperature, in some cases as high as 104 degrees. Effective care and prophylactic treatment, proper diet and control of suppuration by frequent dressing, reduce the temperature, yet for the first two or three weeks the patient is very weak, and loses a great deal in weight. Unless fresh complications set in, the recovery of strength is gradual, and even during this convalescent period the patient must be watched very closely to forestall the occurrence of bronchial and tonsillar infections, which occur commonly because of the condition of the oral cavity.

Diagnosis.

The diagnosis of maxillary fracture is not difficult, as there are unmistakable signs and symptoms. The location and extent of the external wound will suggest to some degree the nature of the injury to the deeper tissues. There is always accompanying inflammation and tenderness of the face. The mouth assumes a peculiar, characteristic attitude, in which the lower jaw hangs downward with the lips somewhat parted, and the symmetry of the face is destroyed. Examination of the mouth shows that the proper occlusion of the teeth and the contour of the arches are upset. There is a displacement of varying degree and an unnatural mobility of the larger fragment. Mastication is made impossible and salivation is greatly increased.

The displacement of the fragments is not so marked in fracture of the upper jaw or of the ascending ramus of the mandible, yet the crepitus and mobility of the parts are apparent.

Prognosis and Complications.

If the injuries are limited to the jaws and mouth, the prognosis as to life is good. With proper and immediate treatment the uncomplicated cases soon show a very marked improvement and the wounds of the mouth and face heal rapidly after the irritating causes are removed. The recovery of the bony tissues is slow, however, as fractures, being compound and comminuted, often multiple, are always infected, which necessarily prolongs the healing process. A conservative estimate of the time required is from two to nine months. Most cases of this type will leave very little deformity of the jaws, while the external wound will leave scars of varying size which can often be reduced by plastic operations.

Even in very extensive cases where there is a great deal of destruction of bony as well as soft tissue, plastic operations either alone or combined with artificial appliances will restore the functional activity of the jaws and minimize the facial deformities. Disturbing factors are the injuries to the head and face, which often endanger the life of the patient, or at least make the question of the general health the leading one. Conditions which may cause immediate death are:

(1) *Secondary Hemorrhage*.—In a majority of cases, fortunately, the bleeding is not of a serious character, yet if the path of the bullet is in the vicinity of the large blood-vessels, extreme care and watchfulness must be exercised.

(2) *Extensive inflammation and suppuration* in the mouth may extend to the air-passages. It is reported that in the early months of the war a large number of fractured jaw patients suffered from septic pneumonia.

(3) *Extensive fracture of the upper jaw* may involve the cranial bones and lead to brain complications, a possibility which should be carefully considered.

On the other hand, a certain percentage of cases will present complications, due partly to unavoidable causes and partly to lack of treatment.

Treatment.

In treating patients who have maxillary fractures, the presence of dangerous illness may be the first consideration. As soon as the general physical condition warrants it, the proper steps are taken to reestablish normal function of the jaws, and to reduce possible deformities of the face.

The methods employed in No. 20 General Hospital in producing these results are as follows:

- (1) The care of the mouth and the external wound.
- (2) Diet.
- (3) Operative procedure.
- (4) Splints and immobilization of bones.

Care of External Wounds.

Prior to arrival in the General Hospital, the patient has received such treatment as will arrest primary hemorrhage and clean the wounds and the mouth. The severity of the case determines the length of time that he will be kept in the dressing-station, and occasionally an operation is performed to remove the foreign body.

On arrival at the General Hospital, which is generally within three to four days, the patient is put to bed and given a complete rest. Free drainage is established to the external wounds, and hyperchlorous acid dressings with hot fomentations are applied

to reduce suppuration and inflammation. Until initial shock and weakness have disappeared no immediate attempt by operation is made to suture the soft parts, set the bones or to remove a foreign body. Exceptions to this rule are made only if the presence of a foreign body, or secondary hemorrhage make an operation necessary to avoid the death of the patient. Hypnotics are administered to relieve pain if advisable and the bowels are kept in proper order by cathartics. The oral cavity in a fractured jaw case is almost invariably in a very unclean condition, due to the excessive salivation, constant suppuration of the wounds and the collection of mucous deposit combined with the previously existing mucorganisms.

The ever-present possibility of many complications and the desire to hasten recovery, compel the most serious consideration of the proper care of the mouth. In spite of the illness of the patient, the oral cavity must be freed from irritating and infective agents.

The procedure used from the hour of arrival in the ward, to establish and maintain cleanliness of the mouth, is as follows:—

(1) Tincture of iodine is applied two or three times a week to the gums and teeth on small cotton swabs.

(2) Pledgets of cotton are saturated with peroxide of hydrogen and rubbed over the teeth and all the mucous surfaces of the mouth, in order to remove particles of food, mucus, clots of blood, &c.

(3) The mouth is irrigated with an antiseptic fluid hourly, or before and after eating in very extensive cases, and ordinarily three or four times a day.

(4) The hard deposits are scaled from the teeth and their surfaces are polished. The mouth is gradually cleared of broken roots and loose fragments. As soon as the patient is able, he is asked to clean his own teeth, and to this end he is supplied with a tooth-brush, kept between times in an individual receptacle containing 5 per cent. phenol solution. The mouth-washes commonly used are boric solution, listerine, weak permanganate of potash and bicarbonate of soda solutions.

(5) The wounds of the mouth are at times packed with iodized gauze, which is changed very frequently.

(6) The excessive salivation is a constant source of annoyance to the patients and is also harmful, as the saliva becomes contaminated with pus from the wounds before being swallowed. To obviate this, hand saliva ejectors are furnished, with instructions as to their use.

(7) To facilitate removal of pus, sputum and dried excretions from the nose and mouth, the exposed parts are sprayed with a mixture of

R	Ol. Ment. Pip.	℥ ss.
	Liq. Cresalis Co.	℥ ii.
	Paraffin Liquid	℥ i.

The proper care of the mouth keeps the attending nurse constantly busy, yet in view of the results obtained her labors are more than compensated.

Diet.

To feed a group of fractured jaw patients with a nourishing and also varying diet is a problem requiring careful study. The majority of patients are able to feed themselves through the mouth, either by means of a porcelain feeder, or in more severe cases by a feeder with a rubber tube attached. The tube is carried far back in the mouth, or down the œsophagus if necessary, and the contents slowly swallowed. The new patients are invariably given liquid food, which as they progress, is changed to semi-liquid or minced diet as the condition may indicate.

Probably because of the unaccustomed diet plus the reaction of his injury, the patient's appetite is very poor at first, and he loses weight. Then there is a gradual and steady gain, even though he is kept on liquids for two or three months.

SUMMARY OF DIETARY.

CONVALESCING PATIENTS.

Semi-Solid.

Breakfast. 7.45 a.m.

Porridge, 1 pint.

Milk, 1 pint.

Sugar.

Tea.

Thin bread and butter.

Alternative:

Bread and milk or gruel.

Luncheon. 11 a.m.

Bread and milk, or

Beef tea, with bread.

Dinner. 1 p.m.

Minced meat.

Mashed potatoes.

Greens.

Milk pudding.

Tea. 4 p.m.

Tea, or bread and milk.

Eggs, 2 lightly boiled, poached, fried, scrambled.

Bread and butter.

Supper. 7 p.m.

Cocoa, 1 pint, or

Bread and milk.

SUMMARY OF DIETARY.

ACUTE INJURY TO JAW.

*Fed through the Œsophageal Tube,
or through Mouth Tube.*

Every two hours during day.

" four " " night.

Milk, 1 pint. Egg 1, or

Strong soup, or

Benger's food, with egg, or

Bovril made with milk, or

Thin arrowroot with Valentine's
Meat Juice, or

Boiled custard, with addition of
stimulants: brandy, or port
wine as ordered.

Principal Basis of Dietary.

Milk, 4 pints.

Eggs, 4.

Soup, 2 pints.

*Semi-fluid Dietary for Convalescing
Patients.*

Same as above in four-hourly feeds.

In addition:—

Baked custard.

Strained fruit juice, or

Stewed fruit.

Jelly.

Benger's food.

Bread and milk.

Porridge.

(*Per diem.*)

Operative Procedure.

Removal of Foreign Substances.—In order to control the infection and suppuration in and about the mouth, it is necessary, in addition to the prophylactic treatment already described, to remove all irritating agents, such as bullets, affected teeth and roots, and loose fragments of bone.

The majority of our patients have had perforating wounds with a distinct entrance and exit; yet there is an appreciable number who have a foreign body imbedded in the tissues in and about the oral cavity. The desirability of its removal is recognized, yet the vitality of the patient, the condition of the wound and the probable extent of the operation, determine in the surgeon's mind the best time for removal. If there is no need of immediate action, the patient is given a rest of several days' duration.

Although I recognize the desirability of preserving all of the bony substance possible and the serviceable teeth and roots, yet I feel that to be too conservative may only hinder the healing process by causing fresh complications. My experience has been that fractured alveolar process is not worth saving, nor are the

teeth and roots which are involved in a fracture, nor the loose fragments of bone which are scattered and imbedded in the surrounding tissues. Failure to remove these irritating agents usually results in necrosis with an eventual greater loss of tissue.

Control of Hemorrhage.—Recognized causes of hemorrhage are: direct injury to the blood-vessels, the presence of foreign bodies and splinters of bone with the subsequent spread of infection; and incomplete fixation of fractured parts, resulting in persistent bleeding because of the mobility of the fragments.

As a precautionary measure, the path of the projectile should be ascertained in order to know beforehand all possible sources of bleeding. The slightest flow of blood may be but the beginning of a serious hemorrhage and should receive immediate attention.

In fractures of the mandible, bleeding from the lingual artery is rather common and at times serious, and it is difficult to arrest because the parts are tender and the patient cannot open his mouth wide. Repeated local packing is fortunately successful in many cases. As an adjunct to this, a specially devised lingual clamp is useful. (Fig. 1) This consists of a piece of heavy wire about 8 or 10 inches long, bent to a "U" shape, with a finger of modelling composition or vulcanite rubber on each end. These ends are applied, one under the tongue and the other externally under the chin, between the hyoid bone and the lingual side of the mandible, and the tissues are pinched at the site of the fracture by the use of elastic bands about the clamp.

In cases of hemorrhage from the nose in connection with the fracture of the upper jaw, the nostrils are packed tightly with gauze soaked in adrenalin chlorid.

Bronchial and Chest Complications.

While secondary hemorrhage, after injury to the jaws and face, is a serious question, complications caused by the sepsis spreading to the air passages, is more common and equally dangerous. Fully one-fifth of the patients suffering from fractured jaws have bronchitis or bronchial pneumonia. Pre-disposing causes of this condition are:

(1) The patient's resistance has been lowered by the shock of the injury, the suppuration in the oral cavity, and hardship or exposure before reaching a hospital.

(2) The fractures and the displacement result in the loss of control of the face muscles, so that the patient becomes a mouth-breather temporarily, and the inspired air passes through the septic oral cavity.

(3) For the relief of pain previous to admission to a general hospital, the patient may have been given a dose of morphia sufficiently large to cause some loss of the laryngeal reflexes, with the consequent further absorption and inhalation of septic material.

(4) During the days previous to arrival at the general hospital, certain patients undergo operations with a general anesthetic, with the result that they acquire septic pneumonia. As a matter of record, it is interesting to note that all patients in No. 20 General Hospital under treatment for fractured jaw and also suffering from bronchial pneumonia have been anesthetized for operation previous to admission. If one considers the great care exercised by the surgeons to avoid pneumonia after general operations, it will be seen that operations on a septic mouth under a general anesthetic increase the chances for after illness.

Prior to administration of a general anesthesia the patient's mouth should be cleaned and irrigated with a strong antiseptic solution. The subcutaneous injection of morphia is avoided, and atropine alone used. If possible, the operation should be performed with the patient in a sitting position, and only a light anesthetic given to preserve the laryngeal reflex.

Abscess and Necrosis.

It is very natural that when an infected area such as the mouth is injured, there should be abundant suppuration and abscess formation at first, for the correction of which, both extra- and intra-oral drainage is essential.

The development of secondary abscesses can be largely avoided by strict attention to the hygiene of the mouth and a careful removal of all foreign and detached fragments. This, however, it is not always possible to do at the first operation, and sometimes it is not advisable because of general conditions. In that contingency, free drainage is effected and maintained until the suppuration stops and the necrosed bone has become de-

tached. It is very common to remove small sequestra months afterwards.

Local Anesthesia in the Mouth.—The value of local anesthesia with its wide range of application about the mouth and face, cannot be over-estimated in its relation to the treatment of fractures of the jaw.

By conductive or infiltrative injections, wounds may be curetted; teeth, loose alveolar process and superficially imbedded foreign bodies removed; abscesses opened; perforations of the palate sutured; muscular adhesions cut; displacements reduced in the adjustments of splints, and the smaller plastic operations performed.

The patient, besides being spared the many inconveniences which accompany the administration of a general anesthetic, can make the work of the operator much easier by his natural sitting position, and his ability to control the tongue and mouth.

Novocain can be used to replace ether or chloroform in nearly all operations except those for opening deep abscesses, removing foreign bodies deep in the tissues, and for extensive plastic operations.

Plastic Operations.—I believe that no attempt should be made to suture the soft parts with the idea of closing a gap until such time as the union of the fractured parts in the correct relation is well under way and permanent splints have been adjusted. The reasons for this belief are, that the wounds are always septic at the first stages, the fracture is followed by more or less displacement of the jaws, and the muscles of the face are in constant tension. As a result, any wound involving the lips or cheek is magnified. On the other hand, if the mouth is cleaned, the infection controlled and the displacement reduced, the disfigurement will be much smaller, and therefore easier to rectify. Long delay is not necessary; nor should we wait until scar tissue is formed. As soon as the splints are adjusted and the wounds show healthy granulation, the parts should be sutured to obtain a minimum amount of scar tissue. Facial supports are of great assistance in moulding the parts and supporting the sutures.

A simple support may be made in the following manner: ordinary hooks are sewed (close together) to the edge of strong

bandage material. A piece of this is stuck with ether-collodion to the face on either side of the sutured portion of the soft tissues, and a strong piece of silk ligature is laced between the hooks to offset the muscular tension. The hooks may be sewed in the same manner to the ordinary adhesive tape.

Another form of facial support to be used in connection with plastic operations is one in which a series of plates of vulcanized rubber, held in place about the forehead and cheeks by a head-gear, serves as a base. To this are attached heavy wires, with vulcanite fingers on the ends to press the tissues at certain places, and offset the muscular tension. There are many possibilities of additions for variations, such as tubes to serve as nostrils, &c. (Fig. 2).

Immobilization of the Maxilla

The fixation of the fractured parts must be done as soon as the patient's condition permits, preferably within a few days. The advantages of early treatment cannot be over-estimated, as the fractured parts can be moved freely and the soft tissues have not started their process of repair; consequently, it is comparatively easy to reduce the displacement and hold the parts in their proper position with simple appliances. On the other hand, if the case is left untreated, scar tissue forms, which tends to increase the displacement of the parts, and the correction of the deformity becomes more difficult and sometimes impossible.

One cannot always apply permanent splints in the early stages, as the condition of the patient may be too critical to warrant giving him any additional strain; yet it is possible to make temporary attachments which will be replaced by permanent ones later.

General Mechanical Principles for Splints.—The immobilization of the maxillary bones is accomplished by:—

(1) Utilizing the remaining teeth, roots and the alveolar ridges as anchorages.

(2) Extra-oral splints as supports over the facial cranial bones.

(3) Intra-osseous sutures.

Splints for the correction of facial and oral injuries, unlike

those in use for the limbs, are not ready made. They have to be planned, constructed and fitted for each case, and they must meet certain requirements:—

- (a) They must be as simple as possible, for complicated appliances are not practical in the mouth.
- (b) When adjusted, they must be easy to clean.
- (c) They must not do any harm to the adjacent tissues.
- (d) They must hold the fractured parts firmly.
- (e) They must allow the moderate use of the jaws.

The guide for the correct immobilization of the maxillary bones is the former occlusion of the teeth, and the importance of following it faithfully cannot be over-emphasized.

It is difficult to classify war fractures of the maxillæ and indicate the proper splint for each case, as there are so many variations. They will be discussed in the following groups: (1) mandible; (2) maxilla; (3) maxilla and mandible.

FRACTURE OF MANDIBLE ALONE

The fracture of the mandible is the more common, and further distinct sub-divisions of this class will assist in the choice of the splint to be applied.

(A) *Single fractures anterior to the last existing tooth whatever tooth that may be.* The degree of displacement is variable and dependent upon the amount of comminution, direction of the fracture and the location. At the symphysis, one fragment is pulled downward and inward; while at the sides it may be inward, downward and backward.

Splints used in the past and admirably suited to present cases are: (1) jacket vulcanite splints; (2) jacket metal splints; (3) band and wire splints.

(a) The ease and speed with which the jacket vulcanite splint may be applied renders it especially adaptable for military surgery. It can be briefly described as a jacket of vulcanized rubber, covering the exposed surfaces of the teeth to the gingival margin, and having the fractured parts connected or bridged by means of a heavy wire. This furnishes an opportunity for cleansing the mouth and dressing the wound. It is retained in place by cement. Accuracy in reconstructing the model, care in

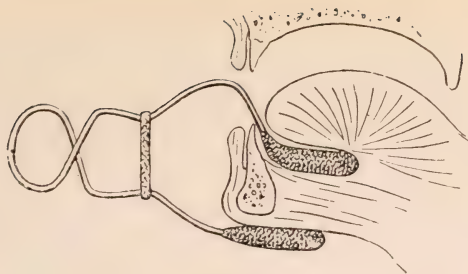


FIG. 1.



FIG. 2.

A series of vulcanite plates is made to fit accurately over the forehead and face in front of the ears, and are connected together with screws. This serves as a basis for different attachments.

The headgear is made of straps, 1 in. in width, which are tightened by a buckle.

A U-shaped bar (German silver No. 12 American gauge) extends between the two ends of the vulcanite, at the approximate level of the upper lip. This bar gives additional rigidity to the appliances and in the meantime is a basis of such additions as artificial nostrils and palatal supports. It is controlled and held in place by a hook or wire near its socket in the vulcanite.

Movable extensions are made of wire (German silver No. 14 American gauge) with vulcanite rubber pads, which can be bent according to the direction of pressure required, to relieve the tension of sutures. They are held in place by ligatures.

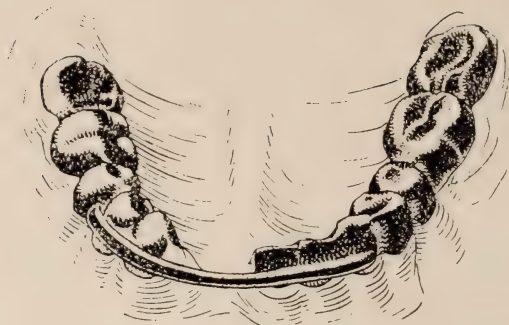
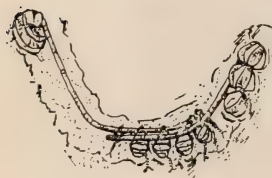


FIG. 3.



FIGS. 4 AND 5.

A form of band and wire splint, useful in the reduction of multiple fractures of the mandible, where a one-piece splint is not practicable. It affords a method for the gradual reduction of extensive displacement of the broken parts, not found in continuous wire splints,

making perfect reproductions of the teeth and strict attention to the occlusion are essential for success.

(b) Metal splints, either cast or swaged of gold, aluminum, or, preferably, German silver (since the latter is effective and inexpensive), are superior to vulcanite, in that they are less bulky, but the construction is more difficult. They are forms of jacket splints, and are retained in place by cement.

(c) The band and wire splint is constructed by fitting bands to selected teeth on each side of the fracture, next taking their correct relations, and finally by soldering a heavy arch wire (12 gauge A.G.) to them, either lingually or buccally. (Fig. 3)

When cemented in place this is an excellent appliance, having many modifications which afford a wide degree of usefulness. It leaves the surfaces of the teeth exposed as a guide to correct occlusion, gives some opportunity for mastication, and does not hinder to any marked degree the cleaning of the mouth. The different steps in its preparation, however, may cause discomfort to the patient if his condition is weak.

(B) *Multiple fractures of the lower jaw anterior to the last existing tooth.* As a rule there is much displacement associated with this type of fracture, since different fragments are pulled by the muscles attached to the mandible outward, downward and sometimes backward. Under favorable conditions the types of splint already mentioned may be used, but if the number of fragments makes their assembling difficult, a sectional band and wire splint may be employed. This sectional splint virtually means two band and wire splints, applied to selected teeth in each fractured portion, with corrugated arch wires elongated anteriorly to pass each other at the median line. Then wire or silk ligatures binding the overlapping arch wires firmly together serve to assemble the jaw as a whole.

(C) *Fractures posterior to the last existing tooth.* This type of case may involve fractures of the body of the bone, the ramus or the condyle. Because of the absence of supporting teeth on the posterior fragment, a different method of fixation is necessary. Immobilization is effected by using the superior maxilla as an anchorage and occlusal guide, and there are certain attendant complications to consider.

(a) The patient cannot masticate.

(b) In septic mouths the necessary frequent irrigations, cleaning and draining of the wounds cannot be accomplished.

(c) If the injury is at the temporo-maxillary joint or at the neck of the condyle, complete immobilization of the mandible may cause permanent adhesion with serious after-effects. Under these circumstances, my practice has been to make a removable (inter-maxillary splint) or appliance, which will hold the parts together and prevent deformities while the wounds are healing. Being removable the splint is easily cleaned; then as soon as suppuration stops and the wounds, both intra- and extra-oral, take a favorable turn, a more permanent appliance is made and the mandible held more firmly.

The most common displacement is that resulting from a fracture at the angle of the jaw. The ramus is pushed forward and somewhat inward, while the main portion is pulled downward and backward, leaving the mouth open. If there is not a great amount of bony comminution, a fracture of the ramus shows very little displacement, whereas fracture of the neck and condyle show gradual downward displacement as the tissues of that region begin to heal. The following types of splints are used in this class of cases, modified, of course, to meet individual requirements:—

(1) *The interdental or intermaxillary splint* is one of the oldest dental splints used for fractures of the jaws. New devices have partly displaced this splint, yet it is still a very effective appliance. It is practically a double vulcanized jacket splint fitting over the remaining and lower teeth, and is removable, being held in place by close adaptation to the teeth. It is bulky, but being removable, it is admirably suited for use as a temporary splint in cases where the mouth and external wounds are in an inflamed and septic condition, and need free drainage. (Fig. 6.)

(2) *Intermaxillary ligation* by means of metal, or band and wire splints. When more effective immobilization of the mandible is desired, more positive methods must be used, such as swaged metal, or band and wire splints, with spurs soldered at suitable places. These are cemented to both the upper and lower jaws, and are united by brass ligature wires over the spurs. It is

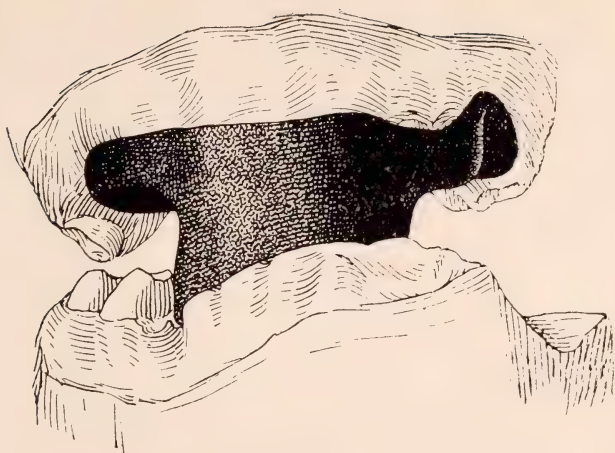


FIG. 6.

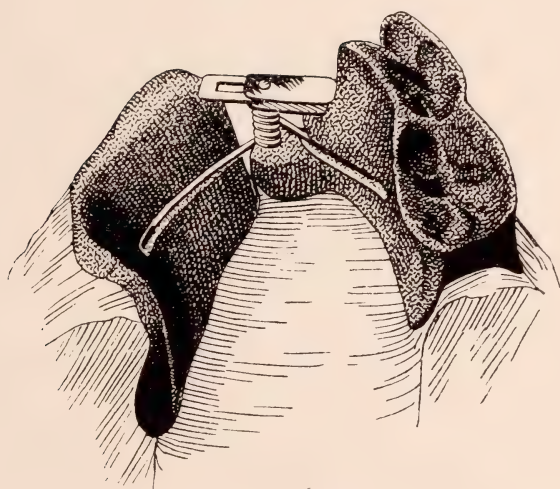


FIG. 8.

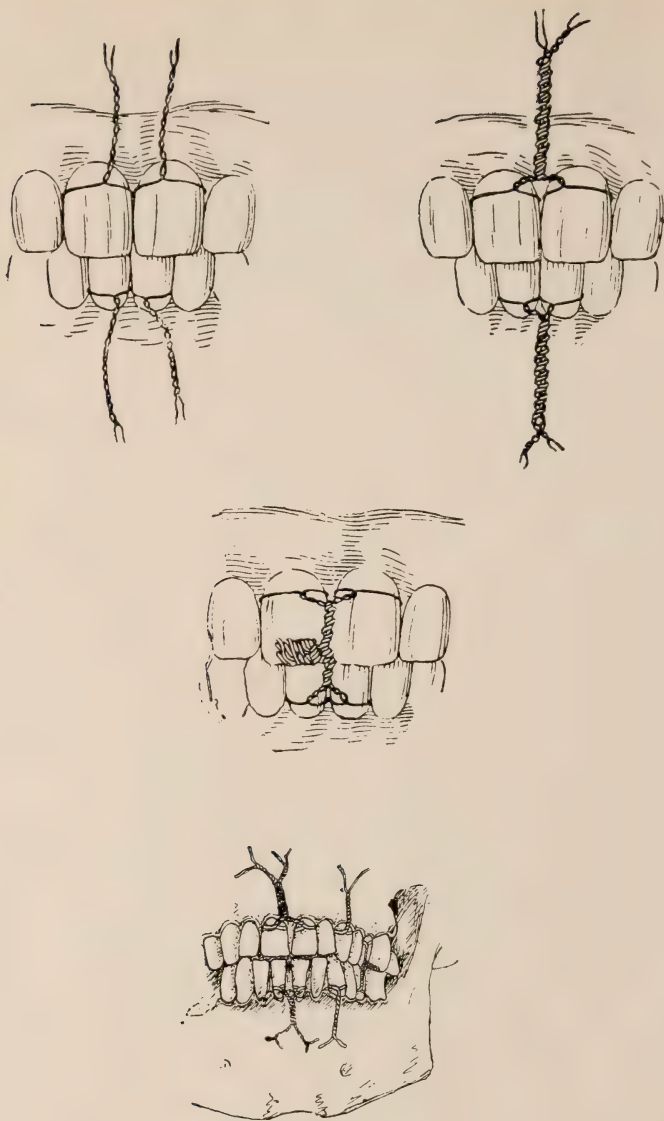


Fig. 7.

Ligation of Teeth with Brass Ligatures.—The wires are passed and twisted around the necks of different teeth, and then the upper and lower teeth fastened together. Bicuspids and molars are wired singly, but incisors and canines should be fastened together in pairs, as in the diagram, then attached to the corresponding teeth of the opposite jaw. This method is especially useful for simple fractures, or fractures with very little displacement, involving the mandible only. It is not applicable in cases with extensive wounds, which require more adequate drainage of the mouth than this treatment affords.

desirable to cover as many teeth as possible to obtain greater anchorage, so that stronger force can be exerted. The ligatures may be removed and the mouth opened at any time.

(3) *Interdental ligating* with fine brass wires has been practised in the past very extensively. This method, while very simple and useful in many fractures as seen in civil life, has a very limited field in war fractures as a permanent method, as they are complicated with wounds; moreover, in many instances very few teeth are left in the mouth for ligation; however, at times it is necessary to use this procedure for a short period to reduce displacement. (Fig. 7.)

After injury to the temporo-maxillary joint or the neck of the condyle, permanent immobilization must be avoided for the reasons previously outlined. The mandible must be at rest, yet a moderate movement encouraged. The jaws are supplied with metal splints with spurs as described above, but instead of using brass wires, intermaxillary elastics are used and the jaw supported with bandages.

(D) *Fractures accompanied by a Loss of Continuity of Bone*.—This condition usually precludes a considerable amount of laceration and destruction of the tissues. The existing parts of the mandible on either side of the gap must be held in their normal positions in order to prevent the development of facial deformities while the wounds are healing. Bands or swaged splints, reinforced with heavy wire and cemented to the teeth, will hold the parts in a firm relation. If there is possibility of the soft tissues contracting during the process of healing, the splint should provide sufficient bulk to offset the further deformity. In such a case a removable vultanite splint may be made, to which modelling compound or more rubber is added periodically to react against the pull of the scar tissue.

In the absence of teeth for attachment (as is found in cases of destruction of the body of the mandible) a wire, unilateral, intermaxillary splint with vulcanized rubber extensions to the affected area, will hold the existing portion of the mandible in a normal position and maintain the contour of the face on the opposite side. If the contraction of scar tissue already formed makes this one-piece splint difficult to adjust, then it may be made in

sections, and the two segments may be provided with a piano-wire spring (18 gauge A.G.) to cause continuous pressure. (Fig. 8.)

The different fractures of the mandible are here outlined in three distinct classes. It happens quite often, however, that a certain case may involve one or all the classes. Under these circumstances, it is necessary to modify the method of fixation, combining the different procedures.

FRACTURE OF MAXILLA

The most common types of war fracture of the superior maxilla alone are:

(A) *In cases of fracture of part of the alveolar process*, my practice has been to remove all loose particles of bone and teeth, curette all the sharp margins, then if the soft tissues are not too much inflamed, to suture them with horsehair; when thoroughly healed, a plate is supplied. The recovery is usually very quick and effective.

(B) *Fractures involving the superior maxilla and part of the palate*, may be comminuted and associated with a great deal of laceration of the soft tissue. The loose portion is as a rule displaced downward and sometimes inward, overlapping the main portion.

If the solid part of the superior maxilla has any serviceable teeth or roots, they may be utilized as an anchorage for a splint, such as the vulcanite jacket, band and wire, or swaged metal, modified of course to meet the special case.

(C) *When fractures combined with perforation of the hard and soft palate* present themselves, the projectile has actually plowed through the hard palate, leaving an overhanging edge on either side.

After removing all the detached particles of bone and teeth, a vulcanite jacket plate is made, covering the entire palate and teeth. This is worn by the patient, and from time to time bits of modeling composition are added to the palatal surface of the plate to gradually push the parts into position. As the palate assumes its normal contour and the modeling composition makes the plate continually thicker and heavier, a new plate is made to meet the new conditions. The perforation is minimized or entirely eradicated.

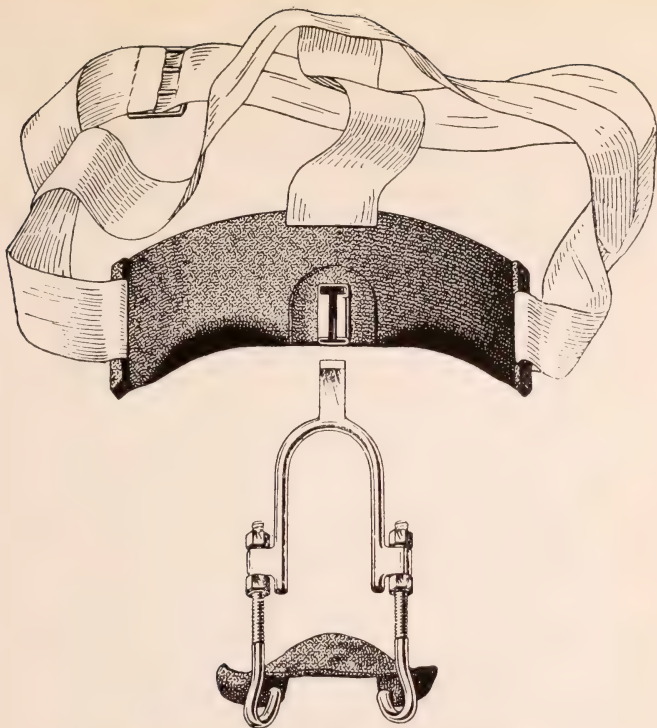


FIG. 9.

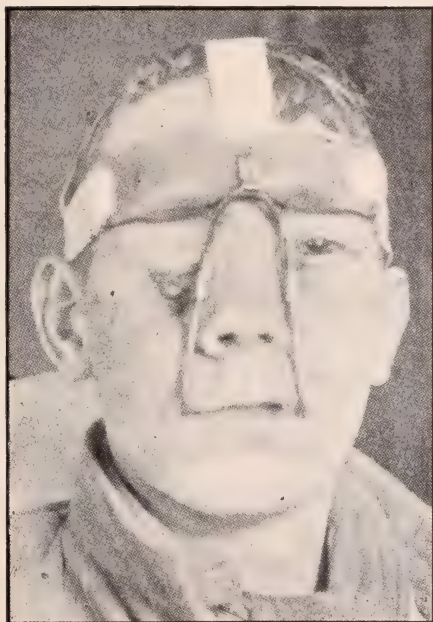


FIG. 10.



FIG. 11.

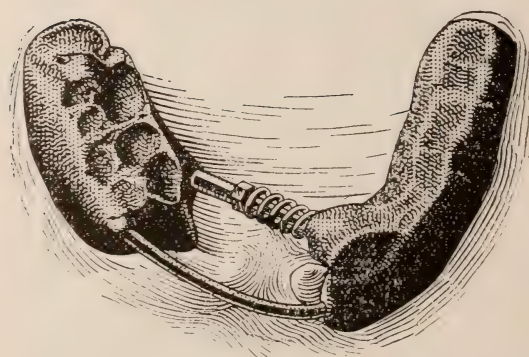


FIG. 12.

(D) *Fractures of the entire maxillary bones* may be associated with other fractures of the facial or cranial bones. Sometimes cases in this class present no displacement and simple bandaging gives effective control.

In other cases, the face of the patient is pushed to one side and the posterior portion of the bones is dropped downward. Since, for the correction of this condition the splint must have external attachment for anchorage, the well-known Kingsley bar splint is admirably suited. This is a jacket splint of vulcanized rubber or of metal, fitting over the upper teeth and alveolar processes. An arm of heavy wire (8 gauge) is attached to each side of the plate, emerging at the corners of the mouth, and bending backward horizontally towards the lobes of the ears. To these arms, straps are attached which pass over the head.

Fractures of the superior maxillary bones unite very quickly, and no delay must take place in completing a suitable splint.

(E) *Fracture with Loss of Bony Tissue*.—If the loss is less than half of the maxilla, and enough solid tissue is left for retention, a jacket (with suitable attachments) is made to cover the missing part. Vulcanized rubber or modelling compound is added from time to time if necessary, as the tissues heal, to preserve facial contour by outward pressure.

If the destruction of the maxillæ is complete, an appliance must be made which will to some degree reproduce them, that will isolate the nasal cavity and will prevent collapse of the upper half of the face.

A splint which fulfils these requirements is made in the following manner: A jacket plate for the roof of the mouth is constructed, from which two bars originate and emerge to pass upwards close to each side of the nose, to terminate in a vulcanite plate which is fitted to the forehead and anterior aspects of the orbits. A headgear holds the appliance in place. (Figs. 9 and 10.)

Extra-oral splints, though very useful, undoubtedly do not supply as firm an attachment as intra-oral splints, and consequently are indicated when immobilization is mechanically impossible within the mouth.

Fractures of Superior Maxilla and Mandible.—Extensive fractures involving the upper and lower jaws are quite common.

Usually any force strong enough to cause such fractures will also cause laceration and destruction of soft and bony tissues.

This type of case is serious, as it may preclude more local and constitutional complications, and show great displacements and distortion of the face.

If only a segment is displaced, the superior maxilla may be assembled by some splint previously mentioned. The lower jaw is then likewise assembled, and if necessary the jaws may be finally immobilized by connecting the two splints by wires or ligatures.

If the displacement in the upper jaw is very marked, it may be anchored by an external splint. Then the lower jaw is assembled, and immobilized by anchorage to the upper splint. Additional counter-pressure may be exerted upward upon the mandible by means of a chin-piece and head bandages if necessary.

Two types of external splints. (1) The Kingsley for the upper jaw, supplied with additional hooks and attachments to aid the immobilization of the lower jaw.

(2) A second type of extra-oral splint is one made of vulcanized rubber, accurately fitting the face from the temporal regions to the chin, and held in place by a strap head-gear. Piano wire springs with the proper tension and location may be attached to it, which exert their force by connecting with hooks on a metal jacket cemented to the teeth of the upper jaw. (Fig. 11.)

Treatment of Delayed Cases.

The process of restoring facial contour and normal occlusion in delayed cases is gradual, dependent on the rigidity of the bony parts and the extent and direction of the displacement, which is (a) downward, (b) inward or (c) lateral.

Appliances used for reduction and fixation in these cases may be following principles; separately, or in combination:—

(1) By continuous force as from the use of springs or rubber bands.

(2) Intermittent force as exemplified by the jack-screw.

(3) Inclined planes: (a) When there is downward displacement, bands or swaged splints with hooks attached are cemented to opposing teeth. The pulling force of elastic or liga-

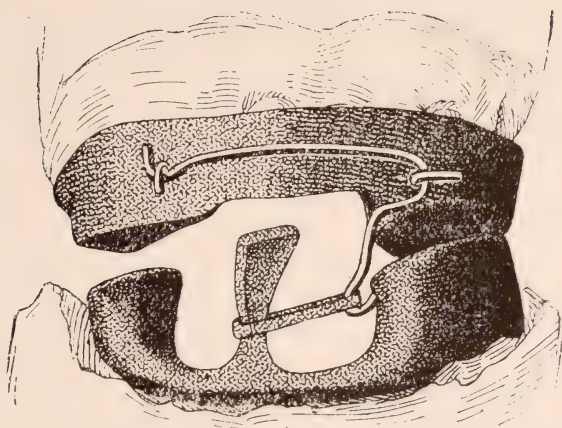


FIG. 13.

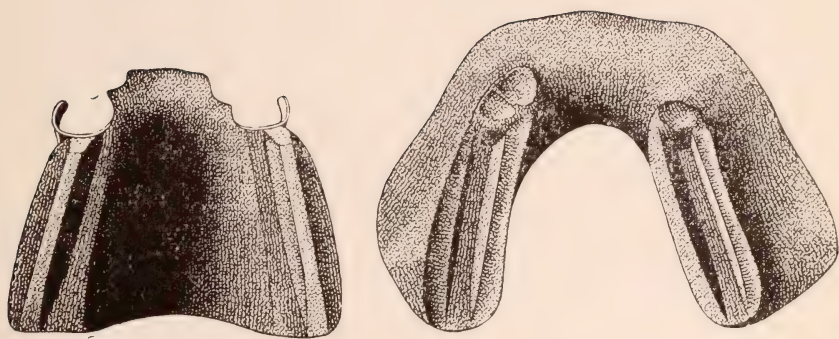


FIG. 14.

A splint used in a practically edentulous case, made in sections to facilitate introduction into the mouth.

tures between the parts will gradually draw them again into occlusion; (*b*) with inward displacement of the fragments the arch assumes a V shape. A jackscrew operating between the parts of a sectional rubber or metal splint which has been cemented over the teeth, will effectually spread the arch to its normal position. The nut on the screw is turned at frequent intervals (Fig. 12); (*c*) in lateral displacement, splints are made with the surfaces in contact inclined in the direction of the desired movement, which is supplied partly by the force of the muscles of mastication and partly by elastics or jack-screws. (Fig. 13.) At times, inclined planes are also used as retainers, after the jaws have assumed their normal relations.

Treatment of Edentulous Cases.

The following come under this group for treatment:—

- (1) Actual edentulous cases.
- (2) Cases in which the teeth are too few in number or too poor to allow proper anchorage for splints.
- (3) Cases in which the teeth have been shattered by a missile to an extent that prevents proper anchorage for splints.

With the teeth, the chief source of retention for splints, destroyed or missing, the best support for the jaws is obtained by applying an interdental splint with firm bandaging, after inflammation and sepsis have been reduced.

The dental surgeon must be careful to avoid adhesion to the alveolar ridge which will handicap the retention of a plate or an oral restoration at a later time.

Bandages.

The proper indication and application of the head bandage plays an important part in the treatment of fractured jaws.

Several kinds recommended by different authors are in use, but probably the most useful is the Barton bandage, on account of its stability and wide range of modifications for holding dressings on the face. It is applied as follows: Beginning at the occipital region, it is carried upward and forward behind the ear to the top of the head, then in front of the opposite ear, passing under the chin and to the top of the head. It continues again to the occipital

region, passed horizontally under the ear, around the chin, under the opposite ear, and back to the starting point.

The horizontal turn may be modified to cross the lips, nose or eye, for the purpose of holding dressings in place. The bandage should be two inches wide and the turn under the chin is passed in the direction in which the force is required.

A useful bandage can be made of straps, one inch wide, to form a head-gear with a buckle in front of one ear to allow an additional strap to pass under the chin.

From my experience, I think that fractures of the jaws should be treated on the same principles as are fractures of the other parts of the body; namely, by free drainage of the wounds and early immobilization of the parts. The coöperation of the dental surgeon and the general surgeon is essential if proper and efficient treatment is to be given.

I wish to take this opportunity of thanking my English colleagues and medical officers for their kind assistance and cordial attitude towards The Harvard Dental Unit during the past eleven months of its service in the Royal Army Medical Corps.

IONIC MEDICATION, WITH SPECIAL REFERENCE TO TREATMENT OF GRANULOMA AND PYORRHEA¹

BY ERNEST STURRIDGE, D.D.S., L.D.S., R.C.S., ENG.

THE subject of my paper is a very extensive one, and I propose simply to give an outline of the practical points, which may be of some value to those who have been using, or propose to use, ionic medication in one or more of the useful therapeutic purposes to which this method lends itself.

A Knowledge of Electro-physics Necessary

I must, at the outset, declare before this great body of scientists, that electrical treatment of any kind savors of uncertainty with all beginners, and the reason for this is that it is a subject which requires a thorough knowledge of electro-physics. Everyone who dabbles in electro-therapeutics should first master electro-physics, and obtain a well-grounded knowledge of the current. It is not sufficient for one to obtain the current from a battery or dynamos and use it, hardly knowing the difference between the terms volt and ampere, or induction and conduction, or anode and cathode. Under the old conception of cataphoresis, this most useful form of treatment was brought into utter disrepute in former days, from no other reason than the lack of knowledge of electro-physics. There was no reliable work to consult on the action of the current from a therapeutic standpoint. This state of things has been greatly changed in the last twenty years by the scientific research of such men as Leduc, Lewis, Jones, Morton, Finzi and many others who might be mentioned.

The Ions

The term "Ions," the formation of ions, migration of ions, penetration of ions, conduction by ions—all require close study and intimate knowledge of their electro-physical properties, in order intelligently to apply ionic medication in the treatment of

¹Read before the First District Dental Society, S. N. Y., Jan. 9, 1917. See disc., p. 110.

dental lesions. No one can have confidence in his method of treatment, without knowing what his medicine is and how it acts, and it is this knowledge of the formation, and penetration of ions, obtained by years of patient study and experimental work on the subject, which inspires me with the assurance necessary to bring this subject to your notice.

Experimental Evidence

Ions which are formed by the electrolytic action of the current are usually colorless, and when one places a zinc electrode, for example, in a gingival trough with some zinc chloride solution and passes a current of, say, four or five milliamperes, for a few minutes, there is no ocular evidence that ions have formed and have migrated into the tissues, nor can one see to what depth they have penetrated. Experimental evidence, however, has been chronicled, in the first place by Leduc², who, by placing an electrode moistened with a solution of sulphate of strychnin on the inner surface of the ear of a rabbit and passing a current, caused the death of the animal from typical tetanic convulsions.

Lewis Jones³ passed ferrous, copper and iodine ions through many layers of parchment papers, afterwards coloring the ions to make them visible and show their penetration.

N. S. Finzi⁴ introduced ferricyanide ions into the knee joint of a monkey through the skin, subcutaneous tissue, patella tendon into the very joint, and by subsequently chemically coloring the ions, was able to see the depth of penetration.

The writer⁵ has published many similar ocular demonstrations of the penetration of ions, the most conclusive being an experiment on the gums and jaws of a living dog, in which the electrodes, current strength and time employed, were identical to those usually used for ionization in treatment for pyorrhea. The salt used was ferrous sulphate, which was dissociated and passed into the tissues electrolytically. The sections of jaw and tissue were removed, and the ions colored Prussian blue by submerg-

² Electric Ions and their Use in Medicine. Leduc, p. 34.

³ Ionic Medication. Lewis Jones.

⁴ British Medical Journal, Nov. 2, 1912.

⁵ Dental Electro-Therapeutics. Sturridge, p. 215.

Royal Society of Medicine, Vol. V., 1912.

Report to V.th. International Dental Congress, 1914.

ing the parts in a solution of potassium ferricyanide; it could then be seen that they had penetrated the soft tissues in every direction, and passed into the alveolar bone to a depth of 15 Mm. These sections of bone were exhibited at the Fifth International Dental Congress, and also in Paris in 1914, at which meetings some of you may have seen them. Unfortunately, however, these specimens were lost at the Congress, but I have here photomicrographs of the ionized gum tissues, which you can see in comparison with similar tissues not ionized.

The object of referring to these experiments is that there should remain no doubt in the minds of my hearers about the reality of the formation and penetration of ions, when a small electric current is passed into an electrolyte such as the tissues of the mouth. An established law of electro-physics is that the ions⁶ are the conveyors of electricity, and when a current is passed from one pole to the other through an area of the body, there is a definite movement of ions in definite directions. Certain ions are positively charged and move away from the positive pole, while at the same time others are negatively charged and they move from the negative pole. This definite direction of ions makes it possible to select certain metallic solutions or alkaloids with a knowledge that when the current passed, they form ions which move from the positive pole; so also, ions of acids move from the negative pole. A full explanation of this dissociation of ions may be found in any recent work on electro-therapeutics.

The Properties of Ions

The antiseptic and anesthetic properties of ions of certain salts and alkaloids have been demonstrated without a doubt in medical treatment, and abundant clinical evidence has been chronicled by medical and dental practitioners, which shows that ions of zinc, copper, iodine, mercury and silver possess highly antiseptic properties, emetin ions destroy amoebae, while cocaine and allied alkaloid preparations produce local anesthesia. The advantage obtained by ionic medication in the use of ions over the ordinary osmotic methods, is that it is possible to concentrate and drive the medicine into the tissues where, in its passage, it acts

⁶ See Dental Electro-Therapeutics. Sturridge, p. 47.

on an area below the surface, which is not reached when a wash is used to irrigate or bathe the surface. We are well aware that in many septic disorders, which we are called upon to treat, the microorganisms penetrate the tissues, and often lurk there in spite of antiseptic applications, keeping up a chronic infection, difficult to disperse. In these cases, if it is possible to saturate the affected areas with an antiseptic which will have an effect on deep-seated bacteria, there is every chance of dispelling the bacteria and curing the lesion.

The Practical Uses of Ionization

The practical uses to which ionic medication lends itself in dentistry are many, and this can be readily understood when we reflect that nearly every operation we perform in the mouth is menaced by the presence of microorganisms, or by the pain which is reflected by the nerve endings of the parts we are concerned with. The fundamental principles of the method aim at placing a medicine in a local area of tissue, and so concentrating it on the parts being treated, that the properties of the particular drug in use will have a direct action on the part. Be it antiseptic, anesthetic, sedative, escharotic or stiptic—the effect is a direct and concentrated application.

I have recorded in my book on Electro-Therapeutics the action of many different ions on various dental diseases, but even since then, fresh information has come to light on the action of ions. I will mention briefly some of the principal and best known ions in treatment.

Under the Antiseptic group: zinc, copper, mercury, silver and iodine ions are the most effective and are useful for the treatment of gingivitis, pyorrhea, chronic alveolar abscesses, granuloma, fistulous tracts, septic root canals, epulis, stomatitis, etc.

Under the Anesthetic group: cocaine, novocain and allied alkaloid preparations produce anesthetic ions, which effectively anesthetize sensitive dentin, pulp, gum tissue and mucous surfaces, and they may be used in conjunction with adrenalin for the hemostatic effect.

Under Miscellaneous groups: argyrol (a colloid preparation), from which silver ions are formed, is useful in treating stomatitis. Salicylic and quinin ions have been strongly advocated by Leduc

and Lewis Jones and others for trigeminal and occipital neuralgia.

The subject of ions and their properties is yet in its infancy, and no doubt many useful ions remain to be discovered. The most striking effects of ionization are to be seen in the treatment of granuloma and pyorrhea by this method, and as they are by far the most important of any I have alluded to, I will give a short sketch of what can be accomplished by this method of treating these conditions.

The Treatment of Granuloma

The treatment of that condition at the root of a tooth, known as granuloma, is at present exciting a good deal of attention. There is not the slightest doubt that these septic sacs, by supplying small doses of toxins which are absorbed direct into the blood stream, are often the sole cause of serious constitutional disorders.

The electrolytic method of treating granuloma is by no means recent. I have treated similar affections for quite a number of years, and Dr. Rhein published a paper in the "Items of Interest" in 1897, describing a method of electrolytically sterilizing roots and abscesses with a zinc electrode.

His deductions regarding the action of the current were, however, not quite correct. He claimed then that "nascent oxychlorid of zinc" is formed at the positive pole when the current is passed, with a zinc point and sodium chloride solution in the root canal.

This action, of course, is contrary to present knowledge of the action of the current on such an electrolyte.

What happens is this: the root canal which contains the zinc point and solution of sodium chloride becomes the + element of an ordinary electric cell, and that part of the body to which is attracted the indifferent electrode becomes the — element. When the current is passed, oxygen and chlorine are eliminated, and at the positive pole they unite chemically with the zinc to form (1st) oxid of zinc on the metal and (2nd) chlorid of zinc in the solution; from this chlorid of zinc in the solution are dissociated the zinc ions, which are repelled from that pole and pass into the canaliculi and out of the foramen into the tissues. At the

same time, at the negative pole, chlorin and potassium ions are formed, and the potassium ions unite chemically with the watery element of the tissues to form caustic potash, which is, in some cases, sufficient to cause a blister or kill the tissues.

It must be remembered that when the current is passed in an electrolyte, such as the body, that there is a double movement of ions, the electro-positive from the positive pole and the electro-negative from the negative pole; it is utterly impossible for electro-negative ions, like chlorin and oxygen, to be repelled from the positive pole, so that oxychlorid of zinc is not formed and driven into the tissues as described by Dr. Rhein. It is the zinc ions alone which migrate at this pole and are the sole agents acting on the tissues to bring about the sterilizing effect.

It is therefore better technic, in my opinion, to use 3 per cent solution of chlorid of zinc and a platinum or zinc point from which zinc ions are readily obtained.

If a fairly large current strength is used (that is 3 to 10 ma.) the required dose of ions is more quickly obtained and the penetration into tooth and soft tissues is much deeper, in a very much shorter time, than if a very small current is used (that is, a fraction of a ma.), and in addition to the ions, the stimulating effect of the current is beneficial to metabolism.

I have shown that ions penetrate the canaliculi to their full length; and ionization with antiseptic ions, like zinc, produces a perfectly sterile root and impregnates the granuloma, destroying the bacteria which permeate the sac.

In addition, pathogenic microorganisms which are contained in the growth are killed by the antiseptic ions and are absorbed into the blood stream, affecting favorably the immunity of these patients suffering from toxemia, when that condition is dependent on the absorption of small doses of toxins from the granuloma.

If the granuloma is ionized two or three times, at intervals of a few days, and the root canal filled, according to the splendid technic advised by Dr. Rhein, I should say there is no more scientific method of treatment known to us at this time; that is, when it has been decided to treat the disease by other than the surgical method of removing the end of the root and the granuloma.

The Treatment of Pyorrhea

For twenty years I have been working at electrical treatment for pyorrhea—at first with very indifferent success; but as I became more familiar with the properties of the current and by dint of hard work in experimenting and finding out for myself the best technic and chronicling the clinical results obtained, I gradually settled down to a regular method from which nothing is likely to distract me. I am satisfied that the disease can be cured by ionic medication in conjunction with methodical attention to many diagnostic details, which are just as important as the treatment. Broadly speaking, it is my conviction that pyorrhea is a purely local affection, starting always from some irritant or series of irritant causes. In diagnosing the particular case (almost every case varies) a regular method should be followed out to detect the direct cause of the primary infection. The bacteria phase of the disease, for which ionization is adequate in dealing, is really secondary to the local irritant cause which starts the trouble. Now it is beyond the scope of this paper to go into details of the causes of pyorrhea; but it is possible to bring to your notice the principal points on which depend successful treatment.

The most important thing is to have a fixed method of diagnosing etiological and pathological factors, with an equally definite method of surgical and therapeutic treatment.

In every case the cause of the disease should be discovered, and this will often be found to be obscurely dependent on a number of factors, converging to one main factor, which is always a *local irritant*. Broadly speaking, this local irritant may be salivary or serumal calculus, faulty occlusion, undue stress, abnormal spacing, faulty contouring of fillings, ill-fitting crowns or dentures, the loss of one or more teeth, adenoids and mouth breathing, imperfect hygiene and a host of other direct causes, which in the early stages start and keep going an inflammatory state of the gingival trough and inevitably bring about that most frequent and almost constant local irritant, serumal calculus. The bacterial phase of the disease is always present, and the breaking down of the gingival or periodontal tissue is simply the result of

the foregoing irritations, in which micro-organisms and also amebae are accompanying factors.

The method referred to consists in detecting which of these irritant causes is responsible, removing it as far as it is humanly possible, and in addition, removing the ever constant bacterial factor.

The Technic of Ionization

Perfect instrumentation in the removal of subgingival tartar and the polishing of the surfaces of the teeth are absolutely indispensable, and on these greatly depends the success of ionization in the treatment.

The electro-therapeutic technic embraces a number of points which, as I have already explained, impose on the operator a knowledge of electro-physics. Taking for granted that this has been acquired, a rough outline of the mode of procedure will now be given.

I usually begin by removing as effectively as possible all local irritant causes and prescribing a mouthwash to be applied with a stiff brush; on subsequent visits (which are usually at intervals of every second day), in addition to continuing instrumentation, ionization is carried out. A zinc electrode is wrapped with a few shreds of cotton wool and saturated with 3 per cent solution of zinc chlorid. This is passed into the pockets and interspaces of affected teeth, the patient holding the indifferent electrode, which is of metal covered with moistened lint. The current is then turned on from the generator, and gradually increased until the patient indicates that it is felt, which usually is from 3 to 5 ma. current strength. The zinc electrode, which is connected with the positive pole of the generator, is pressed to the bottom of the pocket and held steadily there, until the desired dosage of ions is obtained; this dose can be judged by the current strength in use. If it is 5 ma. a shorter time is required than if it is only 2 or 3 ma.; also the severity of the disease at a given point must influence the dosage, but generally speaking, a minute or two in an ordinary pocket will be sufficient, after which the electrode can be removed (but in perfect contact) to an adjoining pocket. When moving the electrode from one pocket to another it may be necessary to reduce the current strength.

I make a point of ionizing every part of the gingival trough, paying most attention to the worst pockets. The electrode is applied to the buccal and labial surfaces and interspaces, and also the palatal and lingual surfaces. It is not sufficient to place a large electrode on the surface of the gums and in that way ionize a large area of tissue at a time, including many teeth; the electrode must be introduced into the gingival trough; the reason for this is that the density of current is influenced by the cross section and surface area of the electrode; the larger the area the less the density, consequently the density of the current is much greater at the point of a small and spear shape electrode than it is on a large flat surfaced electrode, and the depth of penetration of ions from a small electrode is much greater with a small current strength, than it is from the large flat surface electrode. For this very reason it is wrong technic to use too fine an electrode, because the density at the point is so great that it stings, and is so painful that it is impossible to apply sufficient current to carry out ideal ionization.

The electrode should be kept constantly replenished with zinc solution, and when removing it from the tissues, the current should be reduced. It is advisable to use as strong a current as is possible, some patients tolerate as much as 15 ma. in the molar region, but at least 3 ma. should be used and 5 ma. is desirable when possible. The treatment is repeated three times a week at first and twice a week later, until all septic symptoms disappear.

The Effect of Ionization

Ionic medication in pyorrhea treatment places at our disposal a means of dealing with the microorganisms and amebae, which are no inconsiderable factors in the pathological aspect of the disease. The ordinary osmotic methods of irrigation and syringing and general applications of antiseptics are quite inadequate for reaching bacteria which penetrate below the surface and even deep into the alveolar bone of the affected parts. These have to be sterilized in order that tissues may repair and take on healthy metabolism. I have seen many cases where perfect instrumentation with ordinary antiseptic treatment has failed to cure consistently because of the lack of this technical detail. These very cases I have watched after ionization from year to

year, and seen them become more and more immune from re-infection and remain perfect cures. There is another point strongly in favor of the effects of ionization; the electrolytic action of antiseptic drugs introduced into the affected areas, destroys pathogenic microorganisms in the tissues, the bacteria which are killed in the tissues being absorbed into the general circulation. This acts much in the same way as vaccine therapy, only in a much more certain way, inasmuch as the *correct* organisms are killed and carried into the circulation.

It is a remarkable fact that, at first, while the stirring up of bacteria in the tissues by instrumentation is in progress, the symptom of malaise, so often present, is usually increased, but after a few treatments by ionization this disappears, much to the gratification of the patient.

A clinical record of a great number of cases, extending over a number of years, places me in a position to be able to state that not only can very bad cases of pyorrhea be cured by the aid of ionization, but that from year to year I have noted a steady improvement in the general condition of the mouth, so that the teeth are often more comfortable after ten years than the first year or two after the cure has been effected. I should not call any case a cure until after at least two years and this progressive improvement had been noted.

From a constitutional standpoint I have seen numerous cases of neuritis, rheumatism, rheumatoid arthritis, subacute gastritis and many other forms of alimentary toxemia, acne, iritis, all due to absorption of small doses of toxins, which had defied medical treatment (so long as pyorrhea existed), *completely cured* after treatment of the mouth by ionization. In this respect it is gratifying to relate that at last, in England at any rate, the medical profession is recognizing the importance of working with the dentist, and a medical practitioner will eagerly call the dentist to his assistance when septic poisoning is suspected and the mouth indicates the possibility of being one of the sources; often it is proved to be the only source of toxemia and the patient is cured of constitutional disorders by simply removing the source of infection from the mouth.

ANOTHER ILLUSTRATION OF THE NEED FOR CAUTION IN THE INTERPRETATION OF "RESULTS" OBTAINED IN EXPERIMENTS*

A further suggestion of the danger of relying uncritically on the indications of certain types of "clinical" findings.

BY WILLIAM J. GIES

(From the Biochemical Laboratory of Columbia University, at the College of Physicians and Surgeons, New York.)

ONE of the most serious of the obligations that devolve upon the conscientious investigator is the duty of distinguishing decisively between "results" that are *effects of known causes* and "results" that are not effects of known causes, but are merely *coincident* with, and entirely independent of the incidence or prevalence of, such causes. In all experimental work, in biology particularly, there is very great and continuous difficulty in preventing unobserved or uncontrolled causes from inducing "results" that are automatically though mistakenly attributed to imposed influences which may have no discernible effects whatever. The untrained and uncritical observer is particularly prone to accept *miscellaneous coincidences as specific effects*, and to jump enthusiastically to conclusions which, particularly if they fit his preconceptions, are often empirical in import and visionary in fact.

In a conversation on religious subjects, involving questions of spiritual faith, with a member of the Faculty of the Yale Divinity School, twenty odd years ago, I was advised to "*believe your beliefs and doubt your doubts.*" This was timely and excellent advice that I have never forgotten; but my experience in *scientific* investigation—involving primarily questions of material fact—has led me frequently to advise fellow students and collaborators *in research* to do just the opposite: to "*believe your doubts and doubt your beliefs.*" The *untrained* observer in bio-

* *Second* section of the report, for 1915-16, of findings in investigations conducted under the auspices of the First District Dental Society of the State of New York, and presented at the meeting of the Society, at the New York Academy of Medicine, November 6, 1916. The first section, and a supplement thereto, were published in the *Journal of the Allied Dental Societies*: (1) 1916, xi, p. 659; (supplement), 1917, xii, p. 65.

logical research, especially the man who, expert in an art, carries confidence in his capacity in that art into (and dabbles in) "scientific" research, is prone to follow the precept of my revered old friend in the Faculty of the Yale Divinity School—and, *in uncritical research*, to "believe almost anything." The experienced investigator, however, soon comprehends that, *in research*, he must be quite as ready to doubt as to believe, if he would consistently realize the truth. He speedily learns that "science advances because it is *never sure of anything*"; that "the way to truth leads through error"; and that pervading skepticism should be the guide of every careful observation, and that doubt should supervise every serious inference.

I write the foregoing in the light of a vivid recollection of many oversights, of many mistakes of judgment, and of many unwarranted and unfounded deductions. Like the unsuspecting child whose finger has been burned in an attractive flame from a gas jet, I have long since learned, from dismal experiences, that, in seeking the alluring light of demonstrable truth, there is apt to be a disconcerting degree of blistering disappointment from the mistakes that attend that quest.

Recently, despite the many lessons of extended experience, I again very nearly burnt my research fingers very badly. The humor, as well as the instructive significance, of that experience impels me to place an account of it on record as a part of my annual report to this Society. The mistakes and near-mistakes of an investigation are often more instructive, for all concerned, than the actual results of that research—they are especially significant for those who believe implicitly that *clinical* "results" always show what they seem to indicate.

During the summer of 1914, Loewe and I injected trypan blue into a number of animals, among them a white rat, in a preliminary study of the diffusibility of that pigment from the pulp into the enamel of teeth. The results were published in the ensuing fall.¹ We referred, in that paper, to "many extensions of these experiments we are about to inaugurate."

Early in the following September, in a continuation of the experiments in this relation, I injected trypan blue into about a

¹ Loewe and Gies: *Journal of the Allied Dental Societies*, 1914, ix, p. 391.

dozen healthy white rats selected at random from a large "stock." In order to make the results as striking and unmistakable as possible, the injections were repeated several times at suitable intervals. One rat after another succumbed from the effects of the treatment; but, at the end of the experiment, two rats survived. They were very blue and their nutrition appeared to be below normal as a result of the treatment with the pigment. Both animals were held in reserve while the examinations of the teeth of the dead treated-rats were in progress.

These dental examinations were conducted at intervals, as the demands of other more urgent work permitted. *No anomalies, except those of trypan-blue discoloration, were observed in the teeth of these rats.* Meanwhile, the two surviving rats improved somewhat in nutrition and were returned to, and kept, with the stock-supply of rats, for any use to which they might later be conveniently put. This series of trypan-blue tests having been thus concluded, no further *special* attention was given to the surviving pair of blue rats.

The two rats that survived the very drastic treatment with trypan blue, to which I have referred, appeared to be entirely normal animals *at the beginning* of the experiment described. They were then of medium size, appeared to be 6 to 9 months old, and had *fine teeth in normal occlusion*. I was accordingly greatly surprised, about the middle of the ensuing October (approximately six weeks after the first injection of trypan blue into the rats), to discover that the incisor teeth of each of these two blue rats were somewhat malformed and in evident malocclusion, and that these teeth varied markedly from the normal in physical texture and in chemical composition. The molar teeth were likewise in malocclusion, though their disadjustment appeared to be due to general mandibular displacement caused by the malformed incisors. These conditions steadily became more marked. (The reader is reminded that the dentition of the rat is monophyodont. The incisors are rootless and grow continuously throughout the life of the animal. In the white rat the incisors shorten by attrition, and lengthen by growth, at the rate of about 2-3 millimeters per week.)

The two blue rats, as I stated above, had been kept with a

large number of "stock" rats—environment and food were the same; the only primary differences between the blue pair and the rest of the rats appeared to be ordinary inherited disparities in constitution and the divergences due to the treatment of the blue pair with trypan blue. The malformation and malocclusion of the incisors were, accordingly, attributed *provisionally* to the treatment with trypan blue; and I was very glad that my occasional inspections of this pair of reserve rats had been rewarded by what appeared to be an impressive dental discovery. One of the rats was a male, the other a female.

I assumed that probably, if the other rats (in the series that died from the effects of the injections of trypan blue) had lived as long as did the surviving pair, similar phenomena of dental malformation and malocclusion would have been elicited in each of those rats.²

In reflecting on the cause of these dental abnormalities, I adopted the "*working hypothesis*" that the injected trypan blue had induced pathological changes in some or all of the cells involved in the production of the incisor teeth. I then concluded, naturally, to repeat the experiments in order conclusively to test this hypothesis.

"Clinical" effects that were so "*obviously due*" to the injection of trypan blue, and which were the same in kind and degree in two individuals, should have been accepted without any doubt whatever—*many clinicians would say!* "Why waste time on more work?" I concluded, however, to test the matter further before drawing any conclusion other than the *provisional* inference that *probably* the injected trypan blue had been responsible for the dental "results," and, *if so, would cause similar dental effects in other rats—the decisive criterion.*

About the time I discovered the dental condition of this pair of rats, I was beguiled into consenting to "show something" at the "Clinics" that were scheduled to be held at the New York Academy of Medicine, Nov. 2, 1914, at 5 P. M., preceding the presentation of our annual report, later that evening, on "a fur-

²The pair of blue rats that showed the malformation and malocclusion of the incisors lived about seven months after the date of the initial injections of trypan blue (one died on Mar. 15, 1915, the second on April 3), when the dental malocclusion and malformation became so extreme that normal ingestion of food was impossible.

ther study of the effects of acid on natural extracted teeth." In response to the Clinic Committee's request, I concluded to show my impressive pair of trypan-blue rats, in order to make the attending dentists familiar with (if they were not already informed about) the remarkable degree of coloration that may be induced with trypan blue in living animals; also to show the interesting instances of malocclusion these rats exhibited; and, in general, to explain the purpose and nature of the further experiments I planned to conduct, on the possible effects of trypan blue on the growth, character, and occlusion, of the teeth in rats.³

One dentist after another, at the "Clinics," commented pleasantly on the apparent proof that the injected trypan blue had induced malformation and malocclusion of the incisor teeth in the rats we exhibited. The same dentists amiably discounted my suggestion that the dental "effects" could not be regarded as conclusive evidence, however, until identical "results" were induced in other rats by similar treatment with trypan blue.

I was very hopeful, and believed and expected, that further tests would yield striking confirmations of this impressive dental "discovery." I refrained from publishing an account of the original "findings," however, because of the fear that they were "too good to be true." I delayed, in the matter of publication, until I should be certain that the effects observed were not *coincidences*. I have not regretted this precaution, and marvel at the narrowness of my escape from a scientific disaster.

The rest of my story, like the "annals of the poor," is "short and simple."

During the years 1915 and 1916, I injected, into 74 white rats similar, in age, size and condition, to those of the initial experiments, *trypan blue* from the original supply of the pigment; in quantities, and under circumstances, that were practically identical with those that seemed to cause malformation and malocclusion of the incisors in the pair of blue rats described above. Of this number, 43 lived longer, after the initial injections, than the period that elapsed before dental malformation and malocclusion

³ The official title of this demonstration at the "Clinics," which was made with the assistance of Dr. E. G. Miller, Jr., was: "The distribution of trypan blue after injection into living albino rats." The reader will note that no allusion was made, in the title, to the condition of the teeth.

were discovered in the pair of blue rats described above; 21 lived longer, after the initial injections, than did either of that pair of blue rats. *Not a single case of malformation or malocclusion of the incisors, nor of displacement of the mandible, occurred in any of these blue rats!*

The tests were extended simultaneously to include the effects of trypan red. During the same period (1915 and 1916) I injected *trypan red* into 48 white rats from the "stock" that yielded the animals for the trypan-blue tests. The pigment was injected in quantities, and under circumstances, analogous to those for the trypan-blue tests. Of this number of rats, 26 lived longer, after the initial injections, than the period that elapsed before dental malformation and malocclusion were discovered in the pair of blue rats described above; 14 lived longer, after the initial injections, than did either of that pair of blue rats. *Not a single case of malformation or malocclusion of the incisors, nor of displacement of the mandible, occurred in any of these red rats!*

These results, large in number and *unanimous in import*, showed that the "*working hypothesis*" on which these further tests were founded—that the malformation and malocclusion of the incisors in the pair of blue rats described above had been due to the injected trypan blue—*did not work*. That hypothesis was accordingly abandoned.

I now conclude—as I am forced to do—that (a) the malformation and malocclusion of the incisors, in the pair of blue rats described above, were brought about by a cause or causes that were not involved in, but were wholly independent of, the properties of trypan blue, and that (b) the treatment with this pigment did not induce the effects observed in the impressive "clinical" cases of malformation and malocclusion that superficially seemed almost certainly due to the injected trypan blue.

I hope that the foregoing frank record of wrong opinions and negative findings will serve the useful purpose of pointing the moral that a "sure thing," in the interpretation of "clinical" observations in dentistry, is a "certainty" only after it has been *proved* to be entirely true beyond the shadow of a reasonable scientific doubt.

ADDITIONS TO THE DISCUSSION OF THE SIGNIFICANCE OF MARSHALL'S SALIVARY FACTOR*

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IN the December issue of this JOURNAL I pointed out some of the fallacies in Marshall's reply to my first criticism of his claims for his so-called salivary factor. Marshall's reply to our second criticism of his papers on this subject was published in the January issue of *Dental Cosmos*,¹ to which I now respond.

I. Marshall shows in his second reply, as he did before, a striking indisposition both to discuss the points at issue and to recall related remarks that he himself wrote previously. He says, in conclusion, that "the criticisms brought forward by Gies have totally failed to disprove my (Marshall's) *three main points*, to wit, (a) the variability of the alkalinity titrations, (b) the variability of the acidity titrations, and lastly (c) the relative *constancy* of the nicely balanced neutralizing power." All of which is very naïve, to say the least.

Long before the publication of Marshall's first paper, I myself often referred to the normal variability in the degrees of titratable acidity and alkalinity of saliva. This well known variability has never been denied by me—nor by any one else, so far as I know. On the contrary, this reaction-variability is the very *basis* of my criticisms of the essential features in Marshall's diagnostic *claims* for his salivary factor. There has been no criticism, therefore, of the first *two* of what Marshall calls his "three main points"—two points of prior universal acceptance in salivary physiology.

* A supplement to the first section of the report, for 1915-1916, of findings in investigations conducted under the auspices of the First District Dental Society of the State of New York, and presented at the meeting of the Society, at the New York Academy of Medicine, November 6, 1916. The first section was published in the *Journal of the Allied Dental Societies*, 1916, xi, p. 659.

Previous papers, by the author, on Marshall's salivary factor, were published in volume xi of the *Journal of the Allied Dental Societies*, at pages 275 (June), 488 (Sept.), and 659 (Dec.).

¹ Marshall: *Dental Cosmos*, 1917, lix, p. 33.

Marshall says that his "third main point," which, according to him, my criticisms "have totally failed to disprove," is his proof of the "relative constancy of the nicely balanced neutralizing power" (of the saliva). *Marshall himself has found that the salivary "neutralizing power" varies, and that it is higher as a rule in "activated" saliva than in "resting" saliva.* Thus, he evidently means something, in his statement of his "third main point," that his language alone does not suggest. Marshall has often expressed himself carelessly and vaguely in his papers (as I have frequently pointed out). I infer that this statement of his "third main point" is merely another careless assertion. I assume, in accord with his *seeming* intent, that he means, not what he says in the quoted remark in this connection, but rather that there is "relative constancy" in the expressions for the ratio between the total "neutralizing power" of resting salivas and activated salivas, obtained from a given person within a very short period of time for each individual calculation of that ratio (the so-called salivary factor). I have shown, however, that Marshall has not *demonstrated* that the reputed "relative constancy" of his salivary factor is a fact. Shepard and I have *proved* that this ratio (Marshall's so-called salivary factor) is not only *not* "relatively constant," as a rule, but also of no practical value as a diagnostic index in dental caries. When Marshall states that my criticisms have "totally failed to disprove" his "third main point," he says, in effect, merely that our conclusive experimental data mean nothing to him in his present frame of mind.

An effective way to dispose of the findings that Shepard and I published, and which wholly negative Marshall's uncritical claims, would be to disprove the validity of our results with the data of *new tests*, not with denunciation. I again invite Marshall's attention to the following criticism, on page 285 of my first discussion of his initial paper—a criticism that went to the foundation of his experimental errors or prejudices in this relation, but which Marshall has not endeavored to meet in either of his replies:

"If the 'salivary factor' were a significant index, it would be practically constant for any individual in a given state or degree of immunity from, or susceptibility to, caries. In the first part of his paper, where he

confirms the well-known facts that there is a high degree of variability in the reaction of 'normal resting' saliva, and lack of coördination between the reaction of such saliva and the condition of the teeth, Marshall bases his deductions on the results of *numerous* observations on saliva from each of a number of individuals. It is surprising to find, however (for there is no explanation for the change of policy of checking the results by the conventional process of duplication, triplication, etc.), that, in the second part of the paper, where the 'salivary factor' is introduced and discussed, Marshall bases his deductions on the results of *single* observations on salivas from 38 of the 41 individuals concerned. In the cases of the three exceptions in this respect he made *only two* observations in each instance, with the following results for 'salivary factor':

Patient	Salivary factor		Dental condition
	1	2	
70	49.4	43.6	Present immunity, with care
72	70.1	72.9	Present immunity, without care
77	103.4	120.0	Carious, without care

"This general agreement in each case (higher or lower than 80) suggests that the values for the factor, for a particular individual in a given dental condition, are generally uniform. It is obvious, however, that such an agreement, *if observed in only three cases, might be a mere coincidence*. There is no indication in Marshall's paper that two of the three pairs of values were not determined for specimens of saliva obtained, one after the other, within a period of a few minutes in length, and under nutritive and nervous conditions that tended to maintain uniform conditions of secretion during such a short period of collection. *This factor would be mathematically more reliable if it had been obtained consistently for many specimens of saliva from a particular individual under different nutritive and secretory conditions.*"

2. Marshall says (p. 34): "It is evident that Gies infers that I regard the salivary factor as an *etiological* factor in dental caries." Another patent absurdity, if Marshall means what he says. The salivary factor is merely a mathematical device. Why should I infer that a *mathematical device* is, or can be, an "*etiological* factor in dental caries" or in anything else? I could not possibly assume that Marshall ascribes pathological powers to numerals! I have believed, however, from supposedly earnest statements Marshall has published, that the conditions of the saliva, *which the salivary factor is presumed to express*, were regarded, by Marshall, as influences which (—80) induce or maintain immunity, or (80+) cause or permit caries; and I have criticised his claims, accordingly, from that standpoint primarily.

I first came to the conclusion that Marshall regarded his

salivary factor as *an index of etiological influences* in dental caries when I read the following climactic remark in his discussion of the results presented in his first paper on this subject:²

"If it can be determined what physiological process is concerned in the production of an activated saliva, containing, constantly, *a greater neutralizing power than the normal resting saliva*, the writer ventures to suggest that a definite step will be made in the *elucidation of the etiology of dental caries*. Henderson, in considering the *equilibrium* between acids and bases in the animal organism says that 'this acid-base equilibrium may stand in *direct relation to bone formation, rickets and osteomalacia*.' What the *relationship may be between this equilibrium in the saliva and dental caries is indicated in the above tables*" (the tables in Marshall's paper giving his data pertaining to the salivary factor). [See also the last sentence in the quotation, from Marshall's paper, at the top of page 81 of the present paper.]

If the remarks quoted above do not collectively express a belief, by Marshall, that his salivary factor indicates an *etiological* relationship between salivary "neutralizing power" and dental caries, what *do* they mean?

My original conclusion, from reading the foregoing statements in Marshall's *first* paper, that he regarded his salivary factor as an indication of the presence in, or absence from, saliva, of *etiological* influences in dental caries, was confirmed by the appended introductory explanation in the paper presenting the results of his *second* series of tests. In this second paper, after stating that the salivary factor "has suggested a *theory* of one of the *causes underlying the conditions* of acquired and of absolute immunity," Marshall said (giving his "theory"):³

"In bacteriological work we find that by *altering* the acidity or the alkalinity of a culture medium, the *growth of the organism may be inhibited*. The application of this principle to oral conditions is obvious. Assuming the correctness of the salivary factor it will be found that in the condition of dental caries, the relationship of the neutralizing power of the activated saliva to that of the normal resting saliva *varies only between relatively narrow limits*. With immunity, the conditions are exactly the reverse and the relationship *varies within relatively wide limits*. The lactic acid-forming organisms, although capable of growth in a relatively high alkaline medium, flourish *more readily* in one of lesser alkalinity, *such as may be furnished by the saliva found associated with caries*. With the increase of growth of these bacteria there is a corre-

² Marshall: *American Journal of Physiology*, 1914, xxxvi, p. 277.

³ Marshall: *Ibid.*, 1916, xl, p. 1.

sponding increase in the amount of lactic acid formed *and the consequent solution of the calcium salts of the tooth structure.*"

If this second expression of his "theory" does not indicate a belief, by Marshall, that the salivary factor expresses *etiological* relationships in dental caries, what *does* Marshall expect his remarks to suggest?

In a *third* paper, bearing on the significance of the salivary factor, Marshall *elaborated* his theory of the *etiology* of dental caries, as expounded in the last preceding quotation. I assumed that he himself believed he meant what he said, regarding his "theory," in the following words:⁴

"In bacteriological work, the alkalinity of a culture medium may only be varied to a certain degree, depending upon the characteristics of the organism, as well as upon the medium itself. In this way the growth of the bacterium may be inhibited. *When this principle is applied to conditions in the mouth, the following theory naturally presents itself.*

"In the immune conditions, the relationship of the neutralizing power of the normal resting saliva to that of the activated saliva *varies within relatively wide limits.* In the carious condition, however, the opposite is true, and the relationship *varies in relatively narrow limits.* This narrow variation in neutralizing power, and the consequent lowered alkalinity, *favors bacterial growth,* and therefore tends to *induce the development of the lactic acid-forming organisms.* With this development we find the resultant formation of lactic acid in sufficient strength to *act upon the calcium salts of the tooth structure.*

"Immunity to dental caries, then, *may merely mean a change in the salivary secretion,* which, while not *inhibiting* bacterial growth, yet is not as *favorable* a medium for this development as one having a *lower alkalinity,* or a *narrower variation in relationship of neutralizing power.* In the so-called predisposition to caries, this narrow variation obtains, *with a consequent increased rate of growth of the organisms.*"

None of the foregoing statements, regarding his belief that his salivary factor expresses *etiological* relationships in dental caries, was frankly, or even indirectly, disavowed by Marshall prior to the publication of the "reply" I am now discussing and in which Marshall says that, "without going into *needless detail* (!), it is evident that Gies infers that I (Marshall) regard the salivary factor as an *etiological* factor in dental caries." No suggestion of any other significance to be ascribed to his salivary

⁴Marshall: *Dental Items of Interest*, 1916, xxxviii, p. 127.

factor had been published by Marshall, so far as I have learned. It is, therefore, wholly gratuitous of Marshall to suggest surprise that his published opinions on such a probable *etiological* relationship were taken seriously.

With the easy abandon of irresponsibility, Marshall repudiates the seriousness of the remarks above that I have quoted from his papers and now declares:⁵

"Whether the magnitude of the salivary factor is a cause of or an effect produced by caries, or an effect of some cause which also produces caries, *I have not stated*. In my second article, however, there was an hypothesis *tentatively advanced* (!) suggested by an analogy drawn from bacteriology, and to which further reference will be made later (page 34). [Marshall does not refer to the matter "later" in his reply.]

"The measurement of the neutralizing power of saliva is therefore nothing more nor less than a measurement of its buffer value . . . Whether the significance of the buffer value or neutralizing power is direct (that is, due primarily to its power of maintaining neutrality) or is indirect (that is, symptomatic of other as yet unascertained physiological conditions or pathological disturbances), we do not feel as yet able to definitely decide, although in my second article I *tentatively advanced* (!) an hypothesis in harmony with the *former* rather than the *latter* of the above views, *an hypothesis for which definite proof is as yet unpublished*." (Page 36.)

Marshall now says, in effect, that his former claims that the salivary factor expresses *etiological* relationships in dental caries were stated *only* "*tentatively*," and were beliefs "*for which definite proof is as yet unpublished*." Yet his preceding papers presented these beliefs without any suggestion that they were tentatively stated or that they were not expressive of his earnest convictions.

These concessions by Marshall, now, are tantamount to the unwilling admission that the general point in my criticisms of his claims—that he *has not shown* that the salivary factor expresses *etiological* relationships in dental caries—was wholly correct. Very much has been gained, in the cause of truth, by Marshall's belated corrections and admissions on this essential point. I regret that Marshall did not see fit to state these revisions in his first reply to my criticism.

3. Marshall wrote, on page 35 of his last reply as follows:

⁵ Marshall: *Dental Cosmos*: 1917, lix, pp. 24 and 36.

"Gies suggests on page 499 that the saliva collected during an epileptic convulsion should be made the basis of comparison with saliva collected during a time when the patient is quiet. This suggestion is both novel and interesting—novel in that he (Gies) ignores the profound psychic disturbances incident to the convulsion, and interesting in his (Gies') evident disregard of the condition, both nervous and muscular, of the patient at the time of an epileptic seizure."

More of the complacency that overflows from Marshall's comment. I called attention, on the page he mentions (499), to the effects *on certain of Marshall's records for salivary factor if, and when*, the total neutralizing power of normal resting saliva (collected before an attack) was compared with the total neutralizing power of saliva collected "during a convulsion," *Marshall himself having provided the occasion for such a comparison*. The reader of Marshall's reply receives no intimation whatever that my criticism on this point was worded, in part, as follows:

"In his second paper Marshall calls attention to markedly high degrees of acidity for salivas obtained from epileptics 'during convulsions.' He said in this connection (p. 7):

"'Co-existent with this increase there is a corresponding decrease in the alkalinity *which tends to render constant*, within the variation of experimental error, the total neutralizing power of this activated sample.'

"Again (p. 7): 'The relatively high alkalinity to phenolphthalein, of the activated sample in second test, as shown by the minus sign, does not markedly alter the relationship of the normal resting saliva to the activated saliva, for the neutralizing power, as determined separately, has been maintained constant to within a relatively small variation.'

"Also (p. 10): 'The *alkalinity* of saliva produced during this period of stress (epileptic convulsion) is correspondingly lowered, *thus holding constant its neutralizing power*.'

"It is evident that Marshall must have seen that, since (as he says) the *total* neutralizing powers of the salivas were not affected by epileptic convulsions, the recorded values for total neutralizing powers of the salivas he obtained 'during convulsions' *might have been suitably used (with those for the related resting salivas) for duplicate calculations of the salivary factors for the patients involved, without any doubt that the resultant factors would indicate as accurately the prevailing dental conditions, as did the factors when calculated from salivas obtained previously for the corresponding patients*.

"With these reflections in mind one wonders why the salivary factors were not calculated *and recorded* by Marshall *for the salivas obtained by him from patients during epileptic convulsions*. The data for such calculations are *plainly available in Marshall's Tables IV and V*. In

the accompanying Table (2), pertaining to five of a total of eight such cases, I have tabulated the factors for salivas of *carious* cases, which, by falling *below* 80, disagree significantly, in their indications, with the dental conditions of the patients, as *clinically* determined by Marshall.

"The first of each pair of lines in Table 2 gives data pertaining to saliva *unaffected* by a particular epileptic convulsion—all recorded by Marshall. In the second of each pair of lines are data pertaining to saliva obtained *during* an epileptic convulsion—all recorded by Marshall *except the values for salivary factor*.

"TABLE 2. Data pertaining to salivary factors, ignored by Marshall but calculated from Tables IV and V in his second paper, which disagree in their indications with the dental conditions of the patients as clinically determined by Marshall.

Patient No.	Dental condition: Carious.	Resting saliva.			Activated saliva.			Salivary factor.
		Alkalinity.	Acidity.	Total neutralizing power.	Alkalinity.	Acidity.	Total neutralizing power.	
C-27	With care.....	18.85	3.35	22.20	22.80	1.40	24.20	91.73
C-27	.....	.....	.....	.....	4.30	27.80	32.10	69.16 _a
C-29	Without care....	23.15	3.15	26.30	22.55	2.50	25.05	105.00
C-29	.....	.....	.....	.....	3.60	28.10	31.70	82.96 _b
C-33	Without care....	11.35	8.50	19.85	20.90	2.25	23.15	85.75
C-33	.....	.....	.....	.....	6.70	26.90	33.60	59.08 _a
C-35	Without care....	13.55	7.00	20.55	22.85	3.30	26.15 _c	78.59
C-35	.....	.....	.....	.....	1.60	27.00	28.60	71.85 _a
C-46	Without care....	14.75	5.85	20.60	12.20	3.55	15.75	130.80
C-46	.....	.....	.....	.....	2.40	27.60	30.00	68.66 _a

a. Salivary factor for saliva obtained *during an epileptic convulsion*. All the data were given by Marshall except the value for salivary factor, which was not recorded by him.

b. The statement in the preceding footnote applies to this salivary factor. The '5-percent error' allowance (see page 497) suggests that this value might be as low as 77.96.

c. This value is 26.85 in Marshall's table. The corresponding factor in Marshall's table is 78.40. Corrected, the factor appears to be 78.59. [Marshall's "5 percent error" allowance suggests that this value might be as high as 83.59.]

"Here was an opportunity for Marshall to show *convincingly* the 'constancy' of the salivary factor in *duplicate* determinations for patients whose systemic and secretory conditions were, *according to Marshall*, *without material influence on the total neutralizing powers* of the salivas secreted by these patients. Just why Marshall left blank the spaces for salivary factors, in his tables giving the titration data for these patients, *is not explained by him*. A striking feature of the data in Table 2 is the fact that exceptionally high degrees of acidity and very low degrees of alkalinity are associated with small magnitudes of the salivary factor (immunity, below 80).

"For five of eight of the available cases of this kind (caries) we see, then, that the factors for the second specimens of saliva fall *below* 80—below the minimum numerical value indicative of caries—and become *indicative of immunity*, in complete diagnostic disagreement with the factors for the first (corresponding) specimens of saliva with which each second specimen is compared. What becomes of 'constancy' in the salivary factor for a given individual, in a particular dental state, when seen in the light of the striking disparities in the accompanying Table (2)?"

4. The jaunty process of lightly vaulting over unpleasant obstacles is a delightful feature of optimistic progressiveness, but in a *scientific* debate it is better to dispose of impediments than to jump over them. In his empirical insistence that "paraffin saliva" is the only kind of *activated* saliva that yields a reliable salivary factor, Marshall seeks to turn against us the results that Shepard and I obtained with the "paraffin stimulus." Marshall says on this point: "The averages of patients II and III are on the border line and do not present conclusive evidence. It is obvious, then, that *Gies' claim* of proving the salivary factor a variable one is, to quote him, '*without basis in fact.*'"

Let us look into this matter ourselves by summarizing the individual values for salivary factor (for these two patients) that were obtained, by Shepard and Gies, with "paraffin saliva," as Marshall calls it:

SUBJECT II "Excessive caries with care"			SUBJECT III "Present immunity with care"		
Date of the determination.	Salivary factor	Dental diagnosis from the salivary factor.	Date of the determination.	Salivary factor	Dental diagnosis from the salivary factor.
3/8	83.7	Caries	3/11	73.9	Immunity
3/10	84.4	Caries	3/12	99.4	Caries
3/13	92.6	Caries	3/15	72.6	Immunity
3/15	76.8	Immunity	4/19	87.7	Caries
3/22	79.8	Immunity	Average	83.4	
3/31	80.4	Caries			
4/2	85.3	Caries			
4/19	74.4	Immunity			
Average	82.2				

With these details, and Marshall's glittering generality regarding them before us, we see that the salivary factor, *following Marshall's plan of basing the dental diagnosis on single determinations*, means "anything and everything" and that the factor is a "variable one"—mathematically and diagnostically. When Marshall says that "the *averages* of Patients II and III are on the border line," he introduces the idea of averages, *which heretofore he has wholly ignored!* He does not explain why he *now* introduces that expedient. Even that departure does not help Marshall's argument, however, for the averages are 82.2 for Subject II and 83.4 for Subject III—practically the same, and both diagnostic of caries (80+), though one subject exhibited excessive dental caries, and the other was free from it ("present immunity"), throughout the period of

the tests. Yet Marshall is persuaded to say that these averages are "on the border line and do not present conclusive evidence." Surely the reader will inquire: Do not these averages fail to indicate anything definite and is not that fact *very* conclusive *negative* evidence on the reliability of the salivary factor for the diagnosis of dental caries in *individual* cases?

If Marshall decides to insist, hereafter, that *average* data for salivary factor must be available for diagnostic purposes, how many tests will he say must be made, and throughout what period of time must they extend, in order to provide a suitable *average* salivary factor for a reliable diagnosis? Besides, what would be the *practical* value of such a complicated method of diagnosis compared with that of direct inspection of the teeth? Finally, if *average* data for salivary factor must be obtained for the diagnostic use of such a factor, why did Marshall base his own conclusions, on the validity of the factor, on *single* determinations, rather than on averages of many results, for 82 of the 87 individual subjects mentioned by him in his two main papers on this subject?⁶

5. Marshall made the following statement on page 35 of his latest "reply":

"On page 502, Gies suggests that we *disregard the acidity titration entirely*, and work out a factor on the alkalinity basis. On pages 2 and 3 of my (Marshall's) second article the following sentences occur:

"A peculiar fact which has been brought out in this series of tests is that in over 42 per cent. of the cases the activated saliva was alkaline instead of acid to phenolphthalein. In the reporting of these analyses, the alkalinity, *as indicated by a minus sign*, has been *deducted*, for the determination of the neutralizing power, from the alkalinity as found with para-nitrophenol."

"So in this case Gies *disregards the neutralizing power of the activated saliva entirely*, and determines the salivary factor by dividing the *neutralizing power* of the *normal resting sample* by the *alkalinity of the activated sample*. This method of mathematical procedure, in which Gies *ignores the neutralizing power ad libitum* when he *wishes to make a point*, is wholly unjustified. But it proves to Gies that the 'unusually exact check is without basis in fact.'"

"Discussions which include *wilful disregard of the principles involved*, as is evidenced by the foregoing, are without scientific merit, since

⁶ For each of the remaining 5 of the 87 subjects he presented a *pair* of results for salivary factor, but did not use the *average* of any of these pairs.

they owe their existence to *misrepresentation of facts*. The statement at the top of page 503 is thus shown to be *absolutely untrue*. In the instance of patient 79 mentioned in my first paper the difference of 0.40 cc. was *overlooked in the clerical labor of preparing the tables, and remained unnoticed until the article was in press.*"

Only the most attentive readers of all the papers in the series will readily see through the utter confusion of fact, fancy and folly, in this rejoinder by Marshall.

In order to expose the falsity of Marshall's assertion, that there has been "*wilful disregard of the principles involved*," and also in order to show the wantonness of this charge, I quote the following details from my remarks on pages 502-4, to which he alludes:

"In the case of the fifth 'agreement,' the concordance assumes a different aspect when it is calculated by Marshall's original method (see page 503). The salivary-factor data for patient C-40 ('fifth agreement') are recorded in Marshall's paper (p. 7) as follows:

	Resting saliva.			Activated saliva.			Salivary factor.
	Alkalinity.	Acidity.	Total neutralizing power.	Alkalinity.	Acidity.	Total neutralizing power.	
1.....	19.35	6.70	26.05	22.70	+2.65	25.35	102.75a
2.....	19.40	4.30	23.70	26.70	-3.50b	23.20	102.10

a. The factor should be recorded as 102.76.

b. Alkaline, not acid, to phenolphthalein.

"If, instead of subtracting the negative value for acidity (in the second instance for activated saliva), the *neutralizing power* is regarded as equal to at least the value for total alkalinity, as obtained with *p*-nitrophenol (see page 503), then the factor becomes 88.76 instead of 102.10 ($23.7 \div 26.7 = 88.76$)—a disparity, between factors 1 and 2, of 14 per cent. There is continued agreement 'above 80' between factors 1 and 2, on this new basis, but Marshall's reference to this pair of results for salivary factor, as an 'unusually exact check,' is without basis in fact. Marshall obtained the second specimens 'twenty minutes after the (epileptic) seizure subsided' (p. 7). He referred, on page 7, to his observation that the 'saliva regained its "normality." (in reaction) in twenty to thirty minutes after all symptoms of the (epileptic) seizure subsided.'

"In the case, then, of the two salivary factors for patient C-40, there was a marked mathematical divergence (14.00 per cent.) for salivas obtained *within a period of 2 hours and 45 minutes*.

"The facts regarding the five recorded cases, in Marshall's two papers, of 'agreement' between salivary factors for given individuals, fail, accordingly, to support the assumption that the salivary factor is a *constant* (more or less than 80) for a given individual in a particular dental condition.

"In his first paper Marshall recorded a salivary factor for patient 79 that involved an *alkalin* reaction to phenolphthalein. He said regarding this 'exception' (p. 274): 'In patient 79 the activated saliva was alkaline to phenolphthalein 0.4 cc. *n*/200 HCl. This was one of the very few exceptions to the general rule that saliva reacts acid to that indicator. Duplicate determinations were made on successive days, the alkalin-titration figure being 0.3 cc. *n*/200 HCl in one instance, and 0.7 cc. *n*/200 HCl in another.' In his Table XI, Marshall recorded his titration values for the *activated* saliva, and for the salivary factor, for this patient (79), as follows:

Patient	Alkalinity.	Acidity.	Total neutral- izing power.	Salivary factor.
79	35.14	—0.40	35.14	53.02

The total neutralizing power of the corresponding *resting* saliva was 18.63. The salivary factor (53.02) was obtained by dividing 18.63 by 35.14. In this instance, *the only one of the kind referred to in his first paper, Marshall regarded the total alkalinity (obtained with p-nitrophenol) as the total neutralizing power.*

"In his second paper, Marshall followed a *different mathematical course in such cases, without an explanation of the change of plan.* He said (p. 2): 'A peculiar fact, which has been brought out in this series of tests, is, that in over 42 per cent. of the cases, the activated saliva was *alkaline*, instead of acid, to phenolphthalein. In the reporting of these analyses, the alkalinity, as indicated by a minus sign, *has been deducted*, for the determination of the neutralizing power, from the alkalinity as found with para-nitrophenol.'

"Just why the value for the alkalinity to phenolphthalein was *deducted* from that obtained with *p*-nitrophenol was not stated by Marshall. *It is difficult to understand how the total neutralizing power, in the absence of acidity of phenolphthalein, can be less than the maximum alkalinity obtained with p-nitrophenol. I do not know of any other instance of a part being greater than the whole.*

"Marshall does not profess to understand the cause of the unexpected alkalinity to phenolphthalein. *He does not appear to know that it was due to anything that did or did not share in the alkalinity-value obtained with p-nitrophenol.* He speaks of no similar 'corrections' for decreases in acidity. He does not show that, if the alkalinity to phenolphthalein was caused, in whole or in part, by material which affected the value for alkalinity with *p*-nitrophenol, it should have been *deducted*, in whole or in part, 'for the determination of the (total) neutralizing power, from the alkalinity as found with para-nitrophenol.' *Marshall seems to have deducted arbitrarily the phenolphthalein alkalinity-value from that obtained with p-nitrophenol because its opposite, the acidity value, was added thereto.*"

Marshall stated, in the above quotation from his last reply, that, "in the instance of patient 79 mentioned in my (his) first

paper, the difference, 0.40 c.c., was *overlooked* (!) in the clerical labor of preparing the tables and remained unnoticed until the article was in press." I could believe this important statement—important because, unless it is true, Marshall did the very thing he now claims is "wholly unjustified" and which, done by me with his second group of calculations, was, according to him, a "wilful disregard of the principles involved" when I "wished to make a point"—I say, I could believe this urgent claim now, were it not for the fact that Marshall gave this exception in reaction, this "difference," very special attention *before* "the article was in press," for, in the same article he wrote (p. 274): "In patient 79 the activated saliva was alkaline to phenolphthalein 0.4 c.c. $n/200$ HCl. This was one of the very few exceptions to the general rule that saliva reacts acid to that indicator. Duplicate determinations were made on successive days, the alkalim-titration figure being 0.3 c.c. $n/200$ HCl in one instance, and 0.7 c.c. $n/200$ HCl in another." In other words, the "difference" was not "overlooked" and "unnoticed" by Marshall as he now professes, *but was particularly referred to by him*. Besides, if it "was overlooked in the clerical labor of preparing the tables," *i. e.*, if the *minus* sign of this "difference" was "overlooked," why was not 0.4 c.c. *added* to 35.14 c.c., in determining the total neutralizing power, *as it would have been if there had been no minus sign attached to that titration value* (0.4 c.c.)?

A frank confession, by Marshall, that he changed his mind regarding the mathematical method to be employed in such cases, and that he now disapproves of his first procedure (in spite of the fact that it was the correct one) would have evoked an expression of respect for the moral courage involved in such an admission.

6. That Marshall refuses to give careful attention to criticism has been shown repeatedly. The following, from his last reply, is a further illustration of this fact (p. 35):

"The illustrations cited on page 507 clearly indicate the misconception of the factor under which Gies is laboring. As has been explained elsewhere, if we consider a series of alkalinity titrations separately or a series of acidity titrations separately, we fail to arrive at co-ordinate re-

sults. Gies himself determined this in 1910 (*Journal of the Allied Dental Societies*, vol. v, page 276), and reported that 'no significant relationship between the acidity of the average specimen of saliva to phenolphthalein and the condition of the teeth is shown by the results.' But the neutralizing power *does* provide a relationship, and is expressed by the salivary factor."

"The illustrations cited on page 507" of my second criticism of Marshall's papers, to which Marshall refers in the foregoing quotation, were conveyed in the following statements and gave very special consideration to the "neutralizing power," as the reader will see:

"One of the most striking of the many *illustrations*, in Marshall's second paper, of the lack of dental significance for the salivary factor, is the assembly of recorded data for patient C-43; epileptic and among the group designated 'carious without care' (Marshall's Table V). This patient's *resting saliva was more alkalin than that of any other patient referred to in the paper*—it was also the *one resting* specimen that was *alkalin to phenolphthalein!* This patient's *activated* saliva was also strongly (though less) alkalin (evidently produced more copiously and more dilutedly). Yet, in spite of the exceptional power of the salivas from this patient to neutralize acid (*to inhibit the growth of lactic-acid-forming bacteria, in Marshall's opinion*), the salivary factor for this patient was 118.69—a factor which, according to Marshall, *indicates* caries! The absurdity of this diagnostic situation may be seen at a glance in the accompanying Table (4), where the salivary data for this patient (C-43) are directly compared with those for another patient known clinically, by Marshall, to be *immune* to caries. (A pair of similar records from Marshall's *first* paper, for patients 65 and 84, is appended by way of *further illustration*).

"In these illustrations the *resting* salivas from the caries-patients were about three to five times as alkalin as, and relatively very much less acid than, the resting salivas from the immune patients; and the *activated* salivas from the caries-patients were about one and one-half times more alkalin, and relatively very much less acid, than the activated salivas from the immune patients, yet the magnitudes of the salivary factors for the caries-patients were *above* 80 and those for the immune patients were *below* 80—Marshall's line of diagnostic demarcation! *The salivary factor is presumed to express neutralizing power, defensive strength, against acidity and against acid-producing bacteria!* In the above illustrations the activated salivas that are *absolutely* weakest 'on the defence' (those for immunity) are designated *strongest* by the salivary factors; those that are *absolutely* strongest in defensive capacity (those for caries) are indicated *weakest* by the salivary factors. And these salivary factors fail, also, to indicate truthfully which side has the larger *number* of "fighting individuals" (basic molecules).

TABLE 4. Data from Marshall's records showing, illustratively, that the plane of titratable reaction-capacity (absolute value for—strength of—total alkalinity or neutralizing power) is diagnostically misrepresented and the secretory facts misindicated, by Marshall's salivary factor.

Patient No.	Dental condition.	—Resting saliva.—			—Activated saliva.—			Salivary factor.
		Alkalinity.	Acidity.	Total neutralizing power.	Alkalinity.	Acidity.	Total neutralizing power.	
C-43	Carious without care.	44.00	-4.00	40.00	36.20	-2.50	33.70	118.69
C-39	Immunity without care.	8.90	+4.45	13.35*	24.70	+1.95	26.65	50.09
84	Carious without care.	28.90	+3.70	32.60	30.50	+0.50	31.00	105.00
65	Immunity without care.	10.60	+9.86	20.46	20.00	+6.00	26.00	78.70

* Given as 13.45 in Marshall's original, though the factor was calculated with 13.35.

"The foregoing *illustrations* (merely a few of the many of this kind that might be cited) show clearly that the salivary factor is calculated from a shifting, indefinite and misrepresentative basis. We said in the first criticism, in this connection, that 'restless "resting saliva" is the fluctuating foundation for Marshall's "salivary factor"—a *changing mathematical constant*.'"

Does the reader see any relevance in Marshall's comment on these illustrations—any evidence of comprehension, by Marshall, of the facts in these illustrations? The illustrations plainly show the diagnostic misrepresentations involved in the salivary factor, if the salivary factor expresses *etiological* relationships. What, therefore, does Marshall's talk about other matters have to do with the essential points involved in these illustrations?

7. In one part of his reply Marshall makes the remarkable assertion (p. 34) that "Gies' discussion hinges on a comparison of different alkalinities and acidities, but *ignores* (!) the point of importance of the paper (Marshall's), namely, the neutralizing power of saliva." This is so grossly and obviously inaccurate that I refer to it only further to illustrate the author's scientific irresponsibility. (See the last previous quotation above from page 507 of my second paper on this subject.)

8. Marshall's last reply abounds in irrelevancies and misapprehensions, all of which I attribute to the obvious muddlement characterizing Marshall's discussions on this subject. I shall assume that the interested and informed readers of Marshall's and our own papers (if there be any who can possibly find anything interesting in them) will not be misled by any of the partial truths, or by any of the fragmentary quotations, with which Marshall's difficult case is buttressed. Most of these inaccuracies are of no scientific consequence in the light of the

fundamental admissions, by Marshall, to which I called attention above, and to which I shall allude in conclusion.

There is one further statement among these inaccuracies in Marshall's reply, however, on which I feel *obliged* to comment in some detail, because of its directly personal character and, especially, because it is another impressive revelation of the unreliable methods that Marshall employs in the preparation of his papers. I allude to the following charge of "misquotation," made by Marshall on page 34:

"*Misquotation* is sometimes an oversight, but the following *misquotation* by Gies on page 496 can hardly be regarded in that light:

"'But in Marshall's view, I (Gies) recall, this makes no difference, for, as he (Marshall) stated in his first paper, *resting saliva* (and everything in it, of course) *has nothing to do with the causation or progress of dental caries*. It is deficiency in degree of alkalinity of *activated saliva*, not the acidic quality of *resting saliva*, that, according to Marshall, determines susceptibility or immunity.'"

"It is difficult for me (Marshall) to understand what justification Gies has to so *misquote* me. I have never said that the deficiency in degree of alkalinity of activated saliva, and not the acidic quality of the resting saliva, determines susceptibility or immunity. Gies is quite in error when he attributes any such statement as that to me. On pages 267 and 277 of the first article appearing in the February number of the *American Journal of Physiology* (1915) my views on this point are very clearly enunciated."

The statement by me, to which Marshall refers in the foregoing comment, was not, as the original text clearly shows, a quotation but *an assertion, in my own language*. As it was not presented as a quotation, it could not have been the "misquotation" that Marshall represents it to be. *What I said was the correct restatement of Marshall's expressed views that it purports to be*. The following data show that fact very plainly.

"On page 267 of the first article," Marshall "very clearly enunciated" the following view, which I had sharply in mind when I wrote what Marshall now says was a "misquotation" of him by me:

⁷The context of the original shows that "determines" was used in the sense of "gives direction or tendency to," and that the "determination" referred to in this particular case was in the direction of causation of caries, not in the tendency to maintenance of immunity. According to the data in Marshall's tables, certain degrees of deficiency in the alkalinity of activated saliva were not determinant of caries but were coincident with immunity; most degrees of such deficiency, however, were coincident with susceptibility—Marshall says, *permitted caries*.

"In Table 1 is (!) presented the results of the titration of 'normal resting saliva.' . . . The wide variation shown . . . argues against the theory that **acidity** of the resting saliva (that is, of the saliva which is contaminated with the micro-organisms of the mouth and food debris,⁸ is an *influencing factor* in the *causation* or *progress* of dental caries, and also against the view that the **alkalinity** of resting saliva acts as a protecting agent against caries. It will be shown later, however, that the *activated* saliva produced under definite stimulation, is an influencing factor in the production and maintenance of immunity."

This series of statements by Marshall, quoted from the first page of the two that were mentioned by Marshall as giving his *correct* views, supports in *detail*, it will be observed, what I said (in the *first* part of the alleged "misquotation") was Marshall's idea in this relation. I hope Marshall will now "understand what justification Gies has" to so correctly express Marshall's view on this part of the subject.

Turning to page 277, the second page mentioned by Marshall as giving his *correct* views in alleged refutation of my so-called "misquotation," we find the following allusions, the only ones there bearing on the subject:

"These two examples illustrate the ratio obtained in carious conditions. Consider now, the immune ratio. Assume that 15 cc. equals the neutralizing power of the normal resting saliva and that 25 cc. equals that of the activated saliva, then 15/25 equals 60 per cent. In other words the power of the normal resting saliva is only 60 per cent. of the power of the activated saliva and a *reserve neutralizing power* may be secreted under the necessary stimulus. In the carious condition, however, *there is no reserve power or, at least, where the factor is between 84 and 100, it is too small to be of much effect; in fact in those cases where the factor is above 100 per cent. the neutralizing power of the activated saliva is less than that of the normal resting saliva.* If it can be determined what
* physiological process is concerned in the production of an activated saliva, containing, constantly, a greater neutralizing power than the normal resting saliva, the writer ventures to suggest that a definite step will be made in the elucidation of the etiology of dental caries.

"Henderson, in considering the equilibrium between acids and bases in the animal organism says that 'this acid-base equilibrium may stand in direct relation to bone formation, rickets and osteomalacia.' What the relationship may be between this equilibrium in the saliva and dental

⁸This parenthetical explanation is Marshall's, not mine. The "resting saliva" includes, of course, acidic products of fermentation of the food debris by the bacteria to which Marshall refers.

caries is indicated in the above tables" (tables given in Marshall's original).

["The above tables," to which Marshall alludes, show that, for the 90 recorded calculations of salivary factor, the *alkalinity of the activated saliva was markedly increased* in all but 4 of the 90 cases; and that the acidity to phenolphthalein of the same *activated* salivas was *markedly diminished* (in very many cases was *replaced by alkalinity* to that reagent) in all but 5 of the 90 cases. "*Reserve neutralizing power*," on which Marshall lays special stress in the diagnostic evaluation of the salivary factor (see quotation above) is a *reserve of titratable alkalinity* (acid neutralizing power)! Loss or diminution of "reserve neutralizing power" is, therefore, as Marshall uses the term, a *loss* or diminution of titratable alkalinity.]

This second series of statements by Marshall, supports in detail, it will be noticed, what I said, in the *second* part of the alleged "misquotation," was Marshall's idea in the latter relation.

I assume, of course, that Marshall meant what he said in each of these statements and that his views, on the two pages he mentions, were not "tentatively advanced," to be repudiated in a forthcoming "reply." The fact that Marshall himself referred us to the pages on which we find the full justification for what he calls a "misquotation" suggests that possibly, although he still believes what he *wrote* on those pages, he does not, in fact, comprehend the import of what he *said* there.

I hope Marshall will explain to the readers of *Dental Cosmos* just why he protested against my restating exactly the *substance* of what he himself published two years before, but the import of which he no longer appears to appreciate. I hope he will also explain why he characterized this correct restatement as a "misquotation."

9. Our criticisms of Marshall's papers on the salivary factor have brought out the following important facts and revisions:

(a) Marshall disavows his earlier claims that the salivary factor expresses *etiological* relationships in dental caries. He now admits that his claims to this effect were only "tentatively

advanced"—that they were dependent on "an hypothesis for which definite proof is as yet unpublished."

(b) Marshall not only admits that the salivary factor *has not been shown* to express *etiological* relationships in dental caries, but he also concedes that he has given no indication of the associative cause or causes which make the salivary factor appear, in *his* judgment, to indicate prevailing immunity from, or susceptibility to, dental caries.

(c) Marshall insists that the salivary factor, if obtained with saliva that is *activated* by any other excitant than *paraffin*, is diagnostically valueless. He contends that psychic and gustatory (natural) stimuli of salivary secretion must be excluded in the determination of the salivary factor for diagnostic purposes. He has failed to show that these assertions of his are not merely arbitrary assumptions.

(d) Marshall does not suggest that the use of the salivary factor, in the diagnosis of dental caries, offers any *practical* advantages whatever.

Marshall has failed to publish, or I have failed to see in print, results of further tests by Marshall since the appearance of his second paper in the *American Journal of Physiology* (Mar. 1, 1916). None of my criticisms of Marshall's papers has been answered, by him, in terms of newly published *results* on, or of publicly stated practical *tests* of, the doubts I have expressed. Marshall has answered expressed doubts with insistent dogmas, not with details of new determinations.

Results of our further tests of the diagnostic validity of Marshall's salivary factor have shown, as I stated at the meeting of the First District Dental Society of the State of New York last November, that this factor is worthless for the diagnosis of dental caries. Our new results, obtained independently by several collaborators, will constitute a separate section of another portion of our report for 1915-'16, to be published in the succeeding issue of this JOURNAL.

ADDENDUM.

The readers of Marshall's papers and our own, on the sali-

vary factor, will note with interest the following comment, by Bunting and Wixon, on the results of their tests of the diagnostic significance of the salivary factor.⁹

"We found that, in the same individual, as a rule, the factor was fairly constant from day to day and that in the cases of distinct immunes, the factor corresponded with the rule, with the exception of one case, which was that of a young man who had never had any dental caries, and his factor was 105. In the susceptible cases, *the results did not at all agree with Marshall's rule*, as but few of them had a factor of 80 or above.

"Samples of saliva were collected from a group of children who were of the ages at which caries might be expected to occur. The estimated factors in these cases varied over a wide range, some being very low and others high, *no definite relationship being apparent between them and the condition of the teeth in the respective mouths.*

"This method was also applied to a number of cases of pregnant women in the maternity ward of the University Hospital and these were followed for several successive days. The most remarkable feature of the results obtained, was that *the factors were not constant, but varied through wide limits from day to day.* Although these cases are supposedly susceptible, there were as many factors below 80 as above, and *no definite relationship was evident.*

"As we have studied the salivary factor of Marshall in its relationship to mouth conditions, *we are not able to find a reasonable basis upon which a theory of caries control might be built.* The only possible influence with which the acidity and alkalinity may affect the process of caries, is that of *neutralization of the acids of caries, or by favoring the growth of the caries organisms.* In neither of these regards, do we see any correlation or direct relation of the salivary factors of the saliva. *We further fail to find corroboration of the theory in the data which we have obtained from our studies of this method.*"¹⁰

I suggest to Marshall that these, and my own, criticisms of his diagnostic claims for the salivary factor be answered by him from the standpoint of *results of further experimentation*, not from that of complacent expostulation.

⁹ Bunting and Wixon: *Journal of the National Dental Association*, 1917, iv, p. 83. These writers refer to "Mr. William" Marshall as the one who devised the salivary factor, but evidently mean Dr. John A. Marshall its real originator.

¹⁰ It is evident that Bunting and Wixon have understood Marshall as I have (see page 67)—that Marshall claimed that his salivary factor indicated etiological salivary relationships to dental caries.

REPORTS OF SOCIETY MEETINGS

FIRST DISTRICT DENTAL SOCIETY OF THE STATE OF NEW YORK

A regular meeting of the First District Dental Society of the State of New York was held on Monday evening, December 4th, 1916, at the Academy of Medicine, No. 17 West 43d Street, New York City.

The President, Dr. W. B. Dunning, occupied the chair, and called the meeting to order. The paper of the evening was read by Dr. Bissell B. Palmer, Jr., of New York City, and was entitled "The New Era in Dentistry: Its Relation to the Increase in Malpractice Lawsuits."¹

Discussion of Dr. Palmer's Paper

Mr. Edwin A. Jones.—I presume I am to speak to you somewhat from the medico-legal standpoint, yet I cannot forego saying something regarding the last portion of the paper.

What is malpractice? You may say malpractice means just what the term is—bad practice—not good practice; but you have then gone only a short way towards a definition. It applies equally to the lawyer, to the doctor and to the dentist, as it does to the practice of any inexact science, and I take it dentistry is an inexact science.

One thing that should be kept in mind, is that for an error in judgment, where good judgments might differ, the dentist is not liable. He is not responsible for that. There might be cases—let me illustrate to you—where one dentist would say he would extract the tooth, and another would say he would endeavor to preserve it. The man, whichever way he decided, if it were an error in judgment, where good judgments differed, would not be considered at fault.

The spread of malpractice cases is quite considerable. I was somewhat surprised that they were as extensive as Dr. Palmer mentioned. I am not posted so far as that is concerned, but I do know that malpractice cases are on the increase. They are due to different causes, and no one is excepted. Almost the

¹ See Dr. Palmer's paper in full at p. 1, this number of THE JOURNAL.

leading surgeon of the world, who died recently, had half a dozen of them against him, and he was the most scared man you could know when those things happened. Even he, the leader in his profession, was not exempt from those cases, and he was not kindly disposed toward them.

Malpractice suits are the results of various causes. So far as surgery is concerned, the X-ray causes more lawsuits than anything else. It shows a condition which the layman does not understand, anyone can convince him that there is something wrong, and sometimes the picture can be just so nicely manipulated as to show something that is not there.

I had a case not long since, where the Roentgenogram showed a fractured skull. Then I got another picture which showed something entirely different. Subsequently, I had the man in court, and he said he could see the same line in the Roentgenogram which he said he saw in another case that had a fractured skull. The maxim says that figures won't lie; but lies will sometimes figure, and X-rays may sometimes, and sometimes not. Anyhow, I always begin to shiver when I see an X-ray coming around. It is so easy to daub a little lead on each side.

There was a case over in Brooklyn. The lady swore that for years she had had no dental services,, and there was nothing wrong with her. A dentist started in to treat her teeth and her jaw became infected. Her lawyer produced the X-ray picture, and it was a Godsend to me. It showed practically every tooth in the mouth was filled. The X-ray man had overplayed the part.

I listened very attentively to the things Dr. Palmer said, and there were many things I thought I would speak of. I rather think there may be a reason for malpractice cases the Doctor has not mentioned. Some dentists will do all the work before they get any pay, the patient thinks the bill is too stiff, and trumps up a counterclaim. Perhaps if you got your fee first, there would be fewer suits.

Dr. Palmer has stated one thing which seemed very good, and that is the matter of keeping records—a most vital thing. I have heard doctors asked many times what they could remember about a certain case—although they treated fifteen or maybe twenty-five others that day—and they had no records

to support their contention. It is most essential and splendid protection to be able to state you have refreshed your recollection from a record made at the time, that record corroborating and reinforcing the testimony you have given. You can see the effect that would have on a jury, if it were a case that went to the jury.

There is a great deal to be attributed to the chance remark of the dental or medical man, as regards his fellow practitioner. I would not say these remarks were as polite as those mentioned by the essayist. I have heard phrases such as: "What butcher treated you?" "You must have had a gas-fitter attend to you" etc., I have heard them sworn to in court.

The patient goes to one doctor, and then deserts that doctor and comes to you, and you look him over. Of course, you are not averse to the fee, but in order to make the punishment fit the crime, you must make the fellow understand that if you had had charge of the case at the beginning, the present condition would not exist. This is a seed planted and it grows in the man's mind. He enlarges upon it, and at the trial it is not really what the facts are, but what they will appear to be that will count.

In olden times it was said that the love of money was the root of all evil. That does not exempt the dental profession or the legal profession. The desire to make as much out of the case as is fairly consistent with ethics is a laudable one; but the idea of trying to get a lot by scaring the life out of the patient, or making him believe the other dentist did him harm, is certainly not to be commended.

A lawyer cannot successfully prosecute a malpractice suit unless there is a dentist to help out. It is almost impossible to succeed in such a suit, unless the plaintiff is receiving such assistance.

I will not say these cases are all fakes or blackmail. They are not. Often the dentist is in the wrong, and there is no doubt about it. The rights of the people—the rights of the patient who has been injured—should be adequately protected and I have often felt that the patient was treated by a man who has not exercised proper care and who was devoid of skill.

There may soon be a law, as in some states, that the lawyer who brings an unfounded case, shall himself be charged with the costs, if the case be unsuccessful. That would stop more lawsuits than any other procedure. (Applause).

In many states this is now the law, but it is not so here. We have run wild in this State in favor of what is called the poor man's court. We have the highest paid judges and clerks, municipal court judges who draw more salary than the Secretary of State of the United States, and yet we have a situation where we must give to the poor man the poor man's court. He must have his day in court, he need not even pay the witness fee if he makes an affidavit that he cannot afford it, and he need pay nothing toward the prosecution of his action.

There is another proposition that Dr. Palmer mentioned, and that is, the securing of a release. I doubt if you can secure a release. I do not believe it would be legal. In other words, no man can release in advance a person who might do him injury. I would say that was against public policy, because if a patient could do that, he could sign a consent that for a mere pimple or boil on the leg, the doctor could cut his leg off, if he wanted to do so.

Many surgeons require of their patients a signed consent to what is to be done, coupled with a statement that the matter has been explained to them, and they wish Dr. So-and-So to do it for them to relieve them of their suffering. It may be only a little card on which you keep the date of your calls, but that is a powerful factor in the defense of your malpractice claim, when you have the signature of the patient that the uncertainties of the operation have been explained to him, and that he understands them and desires to have the work done nevertheless. That will serve the same purpose as the release of which Dr. Palmer spoke.

Then there is the subject of expert testimony. The *experts* who testify would astound you. They say they know all about the subject, and they may base their knowledge on the fact that they have slept in the house that Dr. Blank passed by one day. They may have attended his clinics—when he was not there—and they know all about the subject. Upon a hypothetical ques-

tion, they express their opinion that he was all wrong, and that he deviated from the custom of surgeons practising in that locality.

Did you ever hear of a lawyer being sued for malpractice? Yet they are judged by the same rules, and make just as many, what might be called apparent mistakes, as other people. We have our Bar Associations and our system of ethics, and while they do not call upon one to shield a man who is wrong, I want to tell you a lawyer will think ten times before he volunteers to make any suggestion against another lawyer, and if he does, the Bar Association will ask him to make good on the proposition he presents.

It may be that the solution of the dental and medical malpractice evil will be attained by handling the matter as the lawyers do. The lawyer may be charged with any sort of unethical conduct, and he must explain it. If he does not, charges are preferred against him before the Bar Association. Only last Friday some men were suspended, one for one year, while others were censured. How many dentists would testify in malpractice cases if they could be treated in that way?

Dr. Palmer referred to some black sheep in the profession. There are black sheep in all the professions. There are a lot of ambulance chasers—there is no doubt about it—but will you tell me just how the ambulance chaser learns that there is something wrong? He learns it from the doctor who receives a rake-off.

Dr. Palmer referred to the Workman's Compensation Act. That perhaps comes into the matter a bit differently from the angle in which he treated it. Of course, the passage of that law took out of the hands of the lawyers a great deal of business. It reduced the ordinary business of the every-day recognized lawyer at least 10 to 15 per cent. It pulled the foundation right from under the ambulance chaser, and took about 50 per cent. of his practice. Up to the time that law was passed, the doctor was an essential factor of the successful prosecution of a claim for damages, and the injured party had to be on the level with his doctor, but under the Workman's Compensation Act the claim can be prosecuted without the doctor. Consequently the lawyer

and the litigant saw a fruitful field for the prosecution of their energies.

I have talked longer than I intended, but if I have thrown out any hint, I will feel repaid for having taken your time, and I am glad of the opportunity of talking straight to the dentist.

Dr. W. H. Haskin.—I feel that the society is to be congratulated on the presentation of this paper, and that Dr. Palmer has given the facts so fearlessly.

I have been asked to speak from the medical standpoint. I would like to say there are many other men much better qualified than I who are doing this work, and who realize the many diseases in which focal infections are an important factor.

What does this mean? It means, to my mind, that you dentists do not appreciate and have not the faintest conception—one man in a thousand—what asepsis means. You do not know. That is a plain statement, but it is a fact, and yet you deal with live tissue in the smallest possible spaces, introduce infection into it, lock it in with gutta percha,—and what happens? The patients develop abscesses. The sepsis has been introduced by the dentist, in my opinion. That is a strong statement, but I can bear it out with a great many facts, if any of you will come to my office.

Some years ago, I began to study the question of teeth, and why it was that you had so much trouble in root canal fillings. I had never seen any roentgenograms of extracted teeth, so I took teeth which had been extracted and X-rayed them, and studied them with the magnifying glass. That proved very interesting.

Here are the plates, so there can be no question about the number of teeth. There were three hundred odd roentgenographed after extraction. I studied, I think, 318 of them. Those terminal canal apices are so small that with your naked eye you cannot see the foramina; but take a magnifying glass and examine them, and you will find many of the most interesting conditions—things pointed out by Stein and others on the anatomy, and by Noyes on the histology, but never shown except with the X-rays.

In 318 teeth, there were 516 roots that I defy any man, no

matter how skillful he may be, to have filled to the very end—I do not care who it is—Dr. Rhein, or anyone else.

Sixty-three cases were found to have multiple foramina.

The root canal ended at a sharp angle in 101 specimens.

The root-canals were so curved that it would have been impossible to pass any instrument through in 53 cases.

Two canals coalesced and ended in one foramen in 70 specimens.

There were four or more roots in seven teeth.

Two root-canals joined and then ended in multiple foramina in four teeth.

There were five bicuspid with very deep single pulp chambers, which ended in multiple short canals less than a sixth of an inch in length.

The root-canals could not be defined in 165 specimens.

Evidence of marked root absorption at the apex was found in 96 specimens.

In no root was a complete root-canal filling found.

One gentleman said he had never seen an absorption of the root on the outside of the tooth. There is absolute evidence in the X-ray of this absorption.

516 of the roots it would have been practically impossible to treat through the canals and render strictly sterile. I said in my paper published in the "Dental Cosmos" in October, 1916:

"The dental profession cannot afford to try to defend obsolete methods, and will almost surely soon be held responsible for neglect to recognize the areas of infection that are to be found in almost every human mouth. The presence of bacteria in the alveolus beyond the socket of the tooth actually involved is very suggestive, and should always be borne in mind, if an effort be made to preserve a tooth.

In the writer's opinion, if there is any doubt whatever as to the complete filling of a canal, and the patient objects to extraction, it would be far safer to attempt amputation of the root with careful canal filling while the canal is exposed. Another point that suggests itself after studying root-canals is that in most of the canals it would be utterly impossible to force any solid gutta percha canal filling through the apex."

The evidence of what happens when you put these gutta percha points down, is clearly shown in several of those pictures, in the doubling up of the cone in the canal. When you examine very carefully—no matter how far down the root canal it goes—you can find areas that are not completely filled.

Examine it with the magnifying lens, and you will find how irregular it is. The idea of being able to take a hard gutta percha point and to fill most of these canals, does not seem reasonable.

I will pass around these specimens that have been put into mouths by some of our leading men here. You will not wonder how these malpractice suits come. They are evidence of work done right in New York City among the best and most expensive dentists.

These are beautiful specimens of teeth intended to be left in position by the dentist, and they were only extracted because I insisted upon it. Two came out of the mouth of a man whom, if I mentioned his name to you, you would recognize as one of the leading ministers in New York City. It was a shame to have the man go around like that. I feel very strongly on the question. While I have been fighting this for years, and expect still to do so, I stand up for the dentists. I have never been called as a witness, and I have not, so far as I know, ever been the cause of a dentist having had a malpractice case brought against him.

The dentist is not entirely at fault. The State has legalized him to go out and do this work. He has passed the State examination, and he is supposed to be qualified to go out and practise dentistry. The methods of teaching dentistry in the past, in New York City, have been rather faulty to say the least. I was connected as professor with a college of dentistry, and I know something about it.

One of these specimens you see here is from a very unfortunate patient. She died of gangrene of both superior maxillae. She had fifteen crowns and bridges in her mouth. Some of them were put in by a dentist who is in this section of the city. I have never met him, but I know that he came near being shot by the husband of the patient. The husband went to the office, prepared

to do damage to that dentist, but the dentist was out. The man is known internationally.

It is not a question of malpractice. This is the point: "Wont' you realize what is going on?" It has been put up to you. There is no doubt about it. The dangers to the human body are innumerable. An infinite number of diseases that have been classed in the past as "cause unknown" are being recognized now as focal infection. Do not think, however, that all focal infections come from the teeth, because they do not.

A paper on focal infection was recently given by Dr. Deland, who is a professor in Medico-Chirurgical College. Dr. Virgil Gibney, Dr. Robert Morris and Dr. Cammack discussed the paper. Dr. Deland is an enthusiast on internal medicine. He said he believed 90 per cent. of all focal infection could be traced directly to diseases of the teeth—that is to diseases of the alveolar process. That is a pretty broad statement to make from a man who sees an innumerable number of cases. He said to the doctors, "I rarely am able to get a dentist to give me an honest opinion as to the danger of the focus in that tooth. Sometimes I will send the patient to one man, and he will say he can fix that tooth. Then I send to another, and finally I get a consensus of opinion from three or four."

Polonius knew what he said, when he told his son

. . . "To thine own self be true,
And it must follow as the night the day,
Thou canst not then be false to any man."

If you are not true to yourself, you cannot be true to the patients who come to you. When the doctor sends a patient to you for treatment, he does not want the patient temporized with, and after the damage is done, the tooth extracted. Dr. Schamberg knows perfectly well, and can tell of many cases where it was absolutely foolish and criminal to attempt to treat the teeth. The trouble is that you will persist in trying to cure conditions which are absolutely incurable, and the patient is in the meantime increasing in difficulties, instead of getting relief at once.

I have read articles galore from the best men in your profession, and I know that many are not practising what they preach. Some of these articles are from men right here in the

First District, who have read papers and preached focal infections, and yet they leave these infections in the jaw. That is a fact which I can bear out. When men who are teaching you are not fair to themselves, or to you, what are you going to do?

The dentists have the biggest opening of any profession in the world at the present time. I wish I were twenty-five years younger and just entering practice, I would go into it myself, especially with the modern knowledge I have had from handling many of these cases. It is the biggest field, but you must realize it is one of the most dangerous. A man operating on an appendix has an easy job compared with root canal work.

The question of absolute extraction of all the pulp from the tooth is a much mooted one. I want to cite one case, which is a beautiful illustration that it is not necessary in all cases to get the pulp out to the very end. The patient is one of the most wonderful and best beloved singers in the world, and yet in her upper jaw practically every tooth is a pivot tooth, or a porcelain crown tooth, which has been there for ten years, and not one has a complete root canal filling. This work can be done, but the chief question is the one of your own personal cleanliness and the ability to handle these cases under absolute sterility and asepsis. Unless the tooth is septic to begin with, there is no excuse for the formation of abscesses, which are so innumerable at the present time.

I do not want to go into the question of escharotics—personally I do not believe in them. Your profession believes in them, and it should be better qualified to judge than I.

I should like to throw out a small hint. When you are working on a root canal to try to get your pulp out, try a mixture of equal parts of menthol, cocain and carbolic acid. Rub together to make an oil. Take a small pledget of cotton, not much larger than the head of a pin, put the mixture on your nerve pulp, and you will get complete anesthesia. You will get sterilization at the same time and following that with alcohol, you can neutralize your carbolic. You can have carbolic acid on your skin, and hold it there, then wash it off with alcohol and you will get no eschar.

I hope Dr. Palmer's paper will open your eyes, and make you really do honest work yourselves. If you do not feel quali-

fied to tackle apical conditions, for Heaven's sake let them alone. Send them to someone who can, and do not run the risk of causing the death of your patient.

Mrs. Boissevain, whom you have read about in the papers, died from sepsis from the teeth. I know of several others.

It is not the question of joints, or endocarditis, or thyroiditis, or appendicitis, or gastric ulcer, or nephritis, and all those other things; but the great question is the patient's vitality. Those patients who are suffering with what is known as lymphocytosis show a tremendous increase in the lymphocytes, the white blood corpuscles. That means these patients are calling on their secondary defenses. They have broken through the first line of defenses, which is in the tissue immediately around the teeth. That is the condition of many people. They are not suffering with endocarditis, or other things, but from a toxemia—a chemical poison generated from the bacteria and forced into the system. The vitality becomes lowered to such an extent that the least depression overpowers the resistance. The first line gives way, and the bacteria are then admitted into the system, you get an attack of endocarditis or other septic infection and your patient dies with an acute disease, although the real sickness from which they have suffered has been of long standing—a toxemia which is going on because of absorption from the mouth.

[The Secretary took the chair, while President Dunning discussed the paper.]

Dr. W. B. Dunning.—It is somewhat unconventional for the presiding officer to discuss a paper, but I received such a cordial request from the author to express my views, that I felt I could not decline.

I feel it is a privilege to discuss a paper of this magnitude, and I use that term advisedly. I believe this paper is the first of its kind, and will stand on record as an important contribution for a number of years to come. It will aid in discussions as the first effort of its kind, and our discussion this evening, which I trust will be a broad one, should be an important commentary on this subject.

One important cause of this tendency to increase in malpractice suits is the fact that dentistry has come to its majority.

Dental practitioners are meeting their full responsibility in the practice of their chosen specialty in medicine. It may be that dental education or dental knowledge, we will say—our profession being somewhat in its youth—has been narrow or localized in the past; but the researches in recent years, resulting in broader knowledge of the significance of dental disease, have changed the aspect of the whole field of dental surgery.

It was not to be supposed a few years ago—a decade ago—that human life might depend very definitely upon a dental operation. That view, as we know, has changed. I think the paper and the discussion have brought out the necessity not only for clear thinking, good judgment and charity on the part of dental practitioners, but the necessity for every one of us to mend our fences—so to speak—in regard to his own knowledge and methods of practice. I am sure every fairminded man tonight has taken this paper to heart, and has been able to place his mental finger upon some defect in his own work.

Our society has instituted postgraduate sections for instruction in advanced work along different lines, notably in root canal work. Of course, these sections are being appreciated, and yet I think many members of our society do not consider that it is important to take the trouble or sacrifice the time to join the classes in order to perfect themselves in technical details. They are well established in their daily work, and the day passes with fair success, so far as they can judge. The average practitioner does not realize, until he is taken up short in some palpable blunder, with perhaps the threat of a malpractice suit, that he is deficient, that his neighbors in the profession are doing better work than he, and that he must bestir himself. Therefore we must improve not only our methods, but we must bring the average practice up to the accepted standards of the day.

It is no surprise to me—or to any one in this room—to find that faulty root work is at the bottom of perhaps 75 per cent. of these malpractice suits which Dr. Palmer has described. Correct root work is the foundation of our restorative work in dentistry, and the more I think upon this subject, the more I believe the radical course is necessary—either a pulpless tooth must be correctly treated, or it must be lost, as a general rule.

I think Dr. Palmer has been very wise in dwelling upon the point that there is always the occasional exception—that we must not be too sweeping—and under certain circumstances, a compromise is feasible—provided the patient is well advised of the actual conditions. Nevertheless, when you come to think of it, there are comparatively few cases where a compromise should be made. Either the root canals should be opened, or the apex, if not penetrated, should be removed, or the tooth must be lost.

Dr. Haskin has presented many interesting sides of the question. I may be misquoting him, but I believe he stated that there were perhaps a hundred, or a larger number of the roots of those teeth that could not be opened.

Dr. Haskin.—I said I believed there were 516 roots out of those 318 teeth that could not be opened.

Dr. Dunning.—It is my personal belief that comparatively few roots in those pictures cannot be opened. I will admit there are some that cannot—that present physical impossibilities—but with all due respect, perhaps this shows the difference between the medical point of view and the dental point of view. The fact that the Roentgenogram does not show it, is no indication that the canal cannot be opened to its apex. The original line of the pulp may be so calcified that it is absolutely impossible to see where it originally existed; and yet we know by the patient and judicious application of the sodium and potassium paste, that trace of the pulp can be removed, the calcific elements in that canal broken up sufficiently to allow a fine instrument to penetrate, and once you do that, it is comparatively simple to open up the canal. I will not exactly say that it is simple, but it can be done.

When you consider the time required for correct root canal work, the millions of teeth to be treated, and the few thousands of dentists now in this country, the inevitable conclusion is forced upon us that a large percentage of pulpless teeth must be lost, because it is impossible—not mechanically, but from the question of time—to care for more than a very limited number. We must hope that science will in some way simplify our technical difficulties.

Dr. Palmer states that it is desirable to open a canal, not to the extent of making the root-filling easy, but to make it possible. This may seem a small matter, but it is about the only point at which I can disagree with him. I think each canal should be so opened as to make it easy to fill. A canal which can be easily filled, is more apt to be correctly filled. I believe in making everything as easy as possible. The success of any procedure is made more certain by reducing its factors to their simplest terms.

Dr. M. L. Rhein.—It is a very great pleasure for me to be here to-night and listen to this admirable paper of Dr. Palmer. Most of you who have followed my work on this subject can perhaps appreciate my own feelings, after thirty years spent in a propaganda of this kind, where the first twenty seemed to be almost fruitless; and I want especially to compliment the President of our society for presenting to us this paper, as heartily as I congratulate the essayist.

While I differ with Dr. Palmer in some of his conclusions, I heartily approve of the general tenor of the admirable paper he has presented to us. There are two sides to his paper, and I want to say a word in regard to what he has said on the subject of malpractice. I do not believe this matter has ever been presented in a better form, especially the manner in which he has emphasized the fact, that without dental assistance it would be impossible to have suits for dental malpractice.

I think this is something we ought to very carefully consider. I should like to call special attention to the point made in modern therapy, that when it came to the notice of a dentist that certain conditions in the mouth were not in accordance with present day standards, it did not necessarily imply that he should proceed to criticise the man who had done that work perhaps at a time when the man who now has a different appreciation of it, doing similar work. I have been a member of this society for thirty-six years, and I have taken the liberty during those years, on many occasions—openly, loudly and aggressively—to hold up to the members of the First District Society a mirror, so to speak, when I felt they were failing to do their professional duty to their patients. I have spoken my mind freely on

this subject, without fear or favor; but I can conscientiously say that during this entire period, while I have used terms that could not be misunderstood, to my colleagues,—I defy anyone to show me an instance where I have countenanced, either personally or under my direction, any criticism of any other professional man, whether I agreed with his procedure or not. From the outset I could never see any benefit to be derived from any such procedure. I could never see how the interest of the patient would be advanced by undermining the status of some other man, however much I might disagree with him; and I could never see how my own self-respect could be maintained, if I pursued such a policy.

I want to take this occasion, therefore, to emphasize most strongly Dr. Palmer's views on this subject; and I am sure that the views that were given in the same direction from the medico-legal aspect simply corroborate this standpoint.

Without dental intervention, I cannot see any possibility of success for most of these malpractice suits. There is occasionally some very glaring thing that may happen professionally, which should arouse a mutual interest through an entire professional society on the side of some injured victim; but as a rule, the individual who endeavors to obtain gain in this manner, is a person who is not entitled to much support.

I felt at first some diffidence in saying anything and it is only due to some of the statements of Dr. Haskin that I am constrained to speak on this subject of root canal work. It is impossible, in a discussion of this kind, to present this question properly to anybody. I might say in this respect, and somewhat for Dr. Haskin's benefit, that I know of no branch of the medical science where 100 per cent. of successes can be claimed. There is always a percentage of failure in operations. This does not necessarily prevent the surgeon from attempting to succeed in certain cases that he considers to be dubious. I do agree with the statement made by Mr. Jones, that the patient is entitled to all we know on the subject for which he has come to us. This has not always been the policy of medicine in the past, and it is one I have always thoroughly disagreed with. It has always been recognized that part of our function is educational—educa-

tion of the public—and unless we are so situated that we can impart to them a knowledge of the conditions that present themselves to us, then I do not think we are fully doing our duty to the patient; and this does not imply invidious criticism of some of the colleges.

I despise the custom of avoiding the knowledge of the practitioner who was in charge of the patient before he came to me. This is simply a method of beating the devil around the bush. The implied criticism of some colleague is much worse than actual criticism. On the contrary, I always make it my endeavor to know who has operated for the patient who is to come under my hands, because I believe I can be of better service to that individual with the knowledge I have acquired of the methods of operation, and the manner in which different men do their work.

What I wanted to say for Dr. Haskin's benefit is, that at a meeting of the Clinical Congress of American Surgeons, held in Boston last October, I had the privilege of giving a fifteen-minute Roentgenographic explanation of how pulpless teeth should be treated, showing that without exception no pulpless tooth is safe in the mouth of an individual, unless the periapical entrance to every foramen, whether there be one or twenty-one, be sealed.

After that meeting, the celebrated Dr. Murphy, who has died within the past year, and who was one of the presiding officers, and Dr. Charles Mayo, whom you have all heard quoted so much in dental matters, came to me separately, and said something to this effect—that until they had seen my Roentgenographic delineation and description, they had never before felt satisfied that a pulpless tooth was safe in the alveolar structure of an individual.

I consider that these two statements, made separately by these two men, more than repaid me for my visit to Boston.

In a discussion of this subject on previous occasions between Dr. Haskin and myself, I took occasion to say to him something similar to what your President told him to-night. I admire the position Dr. Haskin has taken in regard to the detrimental conditions that result from focal infections, but he is in

no form constituted to be a judge of dental technic. He has absolutely an incorrect conception of dental technic as it should be carried out.

I have had failures in attempting to save pulpless teeth, but I have always told the patient in advance that it was questionable whether this tooth could be saved. Take, for instance, the one remaining molar, upper or lower, on one side of the jaw. Can I remove every particle of organic tissue in those canals? Can I eradicate every pathogenic condition in the periapical area? Can I then seal the foraminal entrances, however many there are?

Dr. Schamberg extracted two teeth for a patient of mine yesterday. One of them had been treated for a number of months. There was a time when that tooth was uncomfortable. It had ceased to give any discomfort, but it was impossible with my efforts to accomplish the results I desired, consequently this particular patient could not remain a patient of mine, and retain that tooth in the mouth. That is no criticism of my attempt to save a tooth that would be of inestimable value to the person, if it could have been placed in proper condition.

It was almost a year ago that I invited Dr. Haskin to spend an evening in my office, and I promised him that before he left he would understand what correct dental technic meant. He promised to come, but he has not fulfilled that promise. I have a great fondness for Dr. Haskin. I believe he has the proper feeling on this subject, but he has no right to make the extravagant statements he does, until he has disproved the claims I have made in regard to completing his education on this subject.

Dr. Haskin, in his admirable talk, spoke of a number of prominent dentists, but my name was the only one he used. So he left me in a position to say those things, and I say them with a feeling of friendship which he perfectly realizes.

I want to say to the essayist that I admire the advanced step he has taken; but I fail to understand why he had not swallowed the whole goat. I cannot conceive of the conclusion, where he says, "In cases of freshly devitalized teeth, with careful watching, there is no necessity for encapsulation or sealing of the periapical

entrance to the foramen." I am sure Dr. Palmer will not continue to hold such an opinion for a long period.

Mr. Jones spoke about the false dependence we can place on the Roentgenogram, and he was right. The X-ray by itself is no indicator of just what exists in the mouth. It is simply part of the means we use for the making of a diagnosis. The Roentgenogram never tells the story of the granuloma in its initial state. When the Roentgenogram first discloses rarefaction of the alveolar structure, infection must have been there for some time.

We have heard to-night this wonderful story about this great prima donna with all these imperfect root fillings. I think she takes a great chance in going around with them. We all know something about the subject of immunity, and we know immunity sometimes ceases suddenly. These infections do not occur in the root canal. We do not get trouble from infections in the root canal. We get trouble from some form of microorganism—in most cases the streptococcus—infecting the foraminal entrances at the periapical region.

There is one thing Dr. Haskin said to-night that I want to emphasize. In the devitalization of a tooth that has never had an infection, there is no excuse for an infection to start up afterwards. I can see no excuse but imperfect technic and a lack of aseptic understanding on the part of the dentist. I know, and I say this without any undue pride—I would not consider myself competent to handle a devitalized tooth if it were different—I have an absolute chart record of every operation ever done in my office in thirty-six years; and I defy anyone to find in that record a case of infection of a devitalized tooth that I have handled personally. I have had those things occur in my office after operations by associates whom I was attempting to teach, and I know of no better way of teaching a dentist the principles of asepsis than to have such a thing happen to him.

Many of you know this subject is dear to my heart, and I would like to go into it more fully. I do not want to close without making the statement that, knowing as we do that we cannot tell from the Roentgenogram whether infection is there or not, we do not know if some little portion of vital pulp remains at the

end of a root, and when that vitality may cease. Then we do not know at what moment a streptococcus may be impelled there, seeking for the nutriment which exists in such great abundance at the foraminal termination of a pulpless tooth.

Whether you agree with me or not to-night—fifteen years ago there were not three men in this city who agreed with me on this question—the time will come when, as you have agreed with the other facts, you will unanimously agree with the fact that when devitalization once takes place, the termination of the technic must be the sealing of those periapical entrances, and unless that is done, the tooth must have apicoectomy performed or be extracted.

Now in regard to apicoectomy: that has been spoken of very little. It is simply absurd to do apicoectomy unless the root is perfectly filled and sealed up to the point of the apicoectomy. I have heard a great deal of loose talk about it, and if the patient cannot afford to have the roots properly filled, it is a practical impossibility to follow any such procedure. Apicoectomy is the recourse for that part of the root that cannot be properly filled. I must differ with the essayist when he says apicoectomy is not feasible for molars. In my answer to him, the only teeth I excluded were the third molars, and there I made the statement that I excluded them not because it may not be done, but purely for economic reasons, because we can so generally get along without the third molar.

Dr. Palmer (in closing).—I wish to express my thanks to Mr. Jones and Drs. Haskin, Dunning and Rhein for their interesting and kind remarks.

The conclusions with which I closed my paper touched upon the most important problems before the dental profession to-day. My conclusions were offered not as a solution of those problems, but rather as a basis for practising dentistry safely while those problems were being solved. There have been no developments during the discussion which cause me to reconsider any of the statements in my summary, but I would like to speak on a few of the important points brought out by the gentlemen who discussed the paper.

Mr. Jones has indicated the difficulties which we would meet

in attempting to procure the protective legislation which I recommended. Mr. Jones is certainly in a position to judge such matters, and I feel that his suggestion regarding the costs of an unsuccessful tort action being borne by the plaintiff's lawyer, is excellent. I hope this Society will act upon the suggestion at an early date and attempt to procure such legislation.

I agree in every statement made by Mr. Jones regarding the rash, criticizing statements and testimony of dentists, and I believe his idea regarding suspension of offending members from practice is good, but impracticable. However, the Bar Association could do an excellent service by adopting a resolution condemning in the strongest terms the members of the legal profession, who habitually are guilty of encouraging the institution of groundless mal-practice law suits against physicians and dentists.

Regarding the securing of a release from a patient prior to operating on a dangerous case, I would say that the type of signed statement advocated by Mr. Jones is exactly the form which I have resorted to on certain occasions, and I earnestly recommend the procedure.

Dr. Haskin's discussion was most forceful and the specimens he has shown could be studied many hours advantageously, while his description of the blood, its first and second lines of defense, and its relation to periapical infections was very interesting.

Dr. Dunning has been exceedingly kind in his remarks, and we seem to agree on most points. Regarding the enlargement of root canals, Dr. Dunning feels that they should be enlarged enough to permit the filling of them with ease. While I have the greatest respect for Dr. Dunning's viewpoint, I still feel that excessive enlarging is undesirable and risky.

Dr. Rhein has directed most of his fire on Dr. Haskin, however, a few of his statements call for answers from me. He has stated that there has been a good deal of "loose talk" regarding apicoectomy as an economic procedure in cases of obliterated canals, and he suggests that we all remember that perfect root canal work is essential to a successful apicoectomy. Comparatively speaking, apex amputation is unquestionably an economic procedure in certain cases of obliterated canals. If a

canal can be opened in a short time to within a sixteenth of an inch of the apex—if great difficulty is encountered at that point, and it seems as though many hours of operating might be necessary to make possible complete opening, then I contend that apicoectomy (subject of course to its limitations) early in the treatment, would be an economic step for the patient.

If I did not mention that perfect, scientific root canal work to the point of excision was essential to a successful apicoectomy, it was because I considered the fact too elementary, and I felt that it was known and accepted generally by everyone.

Dr. Rhein has stated that apex amputation is a practical operation for every tooth in either arch excepting the third molar, and he excepts that tooth purely for "economic reasons." In answer I would reiterate the statement made in my paper—that apicoectomy is an operation which it is *physically possible* for a skilful operator to perform on any root of any tooth in either arch, but which, everything considered (including the patient), is very *limited in practicability*. Just as several years ago the "operate anything" surgeons were guilty of "a successful operation, but the patient died" practice, so now I fear many of our over enthusiastic dental operators are guilty of the practice of "a successful apex operation, but the tooth was extracted." My conclusion regarding apex amputations has been read to, and approved by, Drs. Henry Dunning, James Hasbrouck, M. I. Shamberg and Harold Vaughan. These are all operators of wide experience in the surgical field and their opinions should carry weight.

Dr. Rhein advocates the extraction of any freshly devitalized tooth in which every root canal cannot be opened through the apex, and which for any reason cannot have its apex amputated successfully. (My conception of "a successful" apex amputation is that the tooth recovers from the operation, is retained with complete comfort, and is serviceable for a period of time sufficient to compensate the patient for undergoing the operation.) I believe this theory of Dr. Rhein's probably works out very well for the patients of Dr. Rhein, but he must remember that the skill of the average dentist does not compare with his own, and should most dentists govern their practices accord-

ing to his ideas on this point and without his skill, the patients would suffer a wholesale and needless loss of molars.

I say "wholesale" because I know how low is the percentage of perfect canal operations performed by the better than average dental operator, and because I know how low is the percentage of successful apex amputations of molar roots.

I say "needless" because I know of the thousands and thousands of teeth of the class under discussion, with root canals carefully, aseptically, but not quite completely filled which give no discomfort, which are extremely valuable in the arch and which cause no systemic ailment.

I must plead guilty to the choice of the doctrine of "watchful waiting" instead of the alternative "needless wasting" as applied to the case in point. That I am not alone in this attitude is proved by the fact that Drs. Best, Cooke, Dunning, Gillett, Hartzell, Howe, Kells, Merritt, Nyman, Potter, Smith and Tracy all agree with my conclusion covering this point.

Dr. Clarence Grieves has stated: "When it comes to the question of deliberate puncture, that all vital pulp may be removed, it were better to consume the time in conservation; and to stop just short [of puncture]—to remove the pulp to, but not through, the apex."

While I appreciate the sincerity and theoretical strength of Dr. Rhein's remarks regarding encapsulation of apices, I still believe that practice to be prejudicial to the apical tissues of a freshly devitalized tooth. In my paper I stated among other factors on which my conclusions were based, the study of the scientific findings of several dental and medical investigators. I wish to offer statements regarding encapsulation from two of those whom I named, Drs. Grieves and Ottolengui.

Dr. Grieves, in May 1915.—"Sodium and potassium is a most valuable remedy if confined to the tooth, but in cases of perforation [of the apex] it is forced out into the tissues, and while it may combine chemically with the alveolar tissue, as Dr. Rhein says, it also destroys it. Every surgeon now recognizes the dangers of leaving this scarred and shortly-to-be-necrotic tissue as a nidus in the body, a fitting medium for microbic invasion and adaptation."

Dr. Ottolengui, in May 1915.—"If we remove an uninfected living pulp, there is no reason to believe that the pericementum is other than vital and healthy; consequently I can see no reason why we should protrude broaches, wires, or gutta percha, or anything else through the apex of the tooth; I therefore believe that every precaution should be used to fill such a tooth to the foramen and no farther."

I have seen two cases of anesthesia of the chin and lip, following attempted encapsulation of lower bicuspid. The anesthesia in each case still existed five weeks after the excruciating pain had necessitated the extraction of the tooth. I have heard of similar situations. These are somewhat unusual cases of course, but indicate the conservativeness with which we must view the theory of encapsulation of apices.

Regarding the use of the gold shell crown Dr. R. G. Hutchinson, the eminent authority on pyorrhea writes to me as follows:

November 23, 1916.

DR. BISSELL B. PALMER, JR.

MY DEAR DOCTOR:

In replying to your request for my opinion concerning gold shell crowns, I would say that I believe, except in very rare instances, that they are an abomination and should be abolished.

There may be occasional conditions in which their use is justifiable, but the full length shell crown creates an irritation at the gingival margin which results in the lowering of resistance in the surrounding tissues and induces the establishment of an infection.

It is a most prolific source of pyorrhea even when perfectly fitted. It is both unsanitary and mechanically irritating and when not perfectly fitted, which I think is the case in probably ninety-nine per cent of all crowns made, it is excessively harmful.

It must be remembered that vitality offers the only resistance to infection and when vitality is reduced below a certain point, an infection becomes established; therefore, great care must be exercised in all dental operations to maintain normal vital resistance, and any operation involving loss of vitality of any tissue is fundamentally wrong from the surgical point of view. In order to fit perfectly the full shell crown, great destruction of tooth substance is necessary. The shock sustained by the dental pulp through grinding in order to reduce the tooth to proper form for crowning, frequently results in the subsequent death of the pulp.

For this reason it has become common practice to devitalize such teeth before crowning. It is preferable, of course, to allowing the pulp to die and become putrefactive, but it must be borne in mind that the

pulp is the nutritive organ of the tooth and should be retained in a normal condition. If the tooth is not properly prepared and a full length shell crown used, which does not fit at the cervix, the result will be more disastrous still upon the tissues surrounding the tooth and eventually will involve the pulp itself; so that whichever way we look at the matter, generally speaking, this class of crown should not be tolerated.

Almost invariably some other means of restoration will be found possible and should be employed in its place.

About eight or ten years ago I made a statement before one of our societies that in my opinion, humanity as a whole would be better off had no such thing as crown and bridge work ever been invented, because fully ninety per cent of all such work is of faulty construction and does more harm than good.

To-day I reiterate this statement, considering it most conservative in the light of recent disclosures in regard to the pernicious effects produced by unsanitary and ill-fitting crowns and bridges.

If there are any other points which you wish me to cover I shall be pleased to hear from you.

Yours very truly,

R. G. HUTCHINSON, JR.

I have received the following letter from Drs. Best and Moorehead regarding the use of arsenic as a devitalizing agent:

December 1st, 1916.

MY DEAR DR. PALMER:

Replying to yours of 24th, I want to say that I am only too glad to give you my opinion of arsenic when used as a devitalizing agent. Here it is:

In my opinion arsenic is too dangerous a drug to be used in the destruction of a tooth pulp. We have no means of safeguarding the patient against the possibility of the action of the drug passing through the foramina and doing to the tissues surrounding the apex just what it did to the pulp.

Sincerely and fraternally,

ELMER S. BEST.

December 1st, 1916.

MY DEAR DR. PALMER:

I have your letter of November 22nd, and in reply beg leave to state that I have been academically opposed to the use of arsenic as a devitalizing agent; first, because it is not a self-limiting poison. If all the conditions under which arsenic is used could be adequately controlled, its use might be less dangerous, but when one thinks of the anatomy of the root canals, their size, the question of the size of the apical foramen, etc., it would seem that the use of any such poison should be looked upon

as bad practice. Second, I have no doubt at all that a large number of periapical infections are either hematogenous or lymphogenous in origin. The antecedent of the infection is a zone of lowered resistance, and I think this zone has its genesis in an irritation produced by strong drugs used in the treatment of infected root canals or arsenic as a devitalizing agent.

Since pulps may be removed successfully without subjecting the patient to the dangers which I have mentioned above, I do not see why arsenic should be used at all. I touched on this subject in presenting the chairman's address on the Section on Stomatology before the last meeting of the American Medical Association.

Sincerely yours,

FREDERICK MOOREHEAD.

Dr. Clarence Grieves has stated: That, from the study of his library of Roentgenograms, the histories of which are known, he is convinced that there is a greater proportion showing rarefied areas produced by arsenic, particularly about good canal fillings, than resulting from liquefaction from after infection.

I thank Drs. Hutchinson, Best and Moorehead for their letters, and offer their statements to the profession for thoughtful consideration.

Adjournment.

WILLIAM J. LEDERER, D.D.S.,
Editor First District Dental Society.

FIRST DISTRICT DENTAL SOCIETY OF THE STATE OF NEW YORK

A regular meeting of the First District Dental Society of the State of New York was held on Tuesday evening, January 9th, 1917, at the Academy of Medicine, No. 17 West 43d Street, New York City.

The President, Dr. W. B. Dunning, occupied the chair, and called the meeting to order. The paper of the evening was read by Dr. Ernest Sturridge, of London, England, and was entitled "Ionic Medication, with Special Reference to Granuloma and Pyorrhea."¹

Discussion on Dr. Sturridge's Paper

Dr. M. L. Rhein—The very pleasant duty of opening the discussion of this very interesting paper by Dr. Sturridge, who is well known to us by his work on Electro-Therapeutics, has been assigned to me.

It was very considerate of him to call attention to my article on the electrolytic use of zinc, published in 1897. While this is the first publication of the use of what is now generally spoken of as ionism in dentistry, it is only proper at this time to state that, although believing I was the first person to make use of the galvanic current for the elimination of focal infections, nevertheless the thought which inspired this form of electrotherapy emanated from the mind of Dr. William G. Morton, to whom all the credit is due.

In regard to the essayist's criticism of my explanation of the action of the current on a pure zinc electrode—it may be pertinently stated that in asking for expert opinion as to what took place, I was given two explanations. One, that oxychlorid of zinc was formed, and the other that zinc chlorid was formed.

Far be it for me, a mere clinician, to hold an opinion on a chemical equation where experts differ, so that for the time being I said oxychlorid of zinc was formed. Very soon after this I renounced my faith in those who said oxychlorid of zinc, and

¹ See Dr. Sturridge's paper in full, p. 49, this number of THE JOURNAL.

joined the ranks of those chemists who said chlorid of zinc. The latter word contained less elements, was a smaller word and more easily pronounced, and so I remained in the camp of the true believers.

Seriously, however, the essayist overlooked the fact that I used ionization at this period in two different forms. When I was ionizing the dental tubuli, I first sealed the foraminal openings with gutta percha. Where, however, there was periapical infection, my fine zinc wire was passed through the foraminal opening so that the anode came in actual contact with the granuloma. The real scientists all agree that before any zinc ions can permeate the tissues, zinc ions must be present or produced. This is the basis of my nascent zinc chlorid theory. It is conceded that in this freshly born state a compound is found in its most intensive form.

What part this nascent zinc chlorid plays in pathogenic elimination is even now uncertain, because according to the essayist, it must be present, if only for the shortest space of time.

For at least twenty-two years, my use of ionic medication has been constantly increasing, as I have witnessed the satisfactory results obtained in this manner, and Roentgenology has brought us clinical evidence that is not to be denied its due weight.

The average roentgenogram of dental tissues has very little value in studying density or lack of alveolar structure. In the first place, to put a picture of these tissues on the witness stand, it must be taken with a long time exposure, in order to bring out detail that can be studied through a magnifying glass. Pictures failing to show such detail, possess no value from the witnesses' standpoint. Furthermore, the original films must always remain under the call of the court as corroborative evidence. From the examination of pictures of such quality, it has been found that where ionism has been used and followed by sealing of the periapical entrances to the root canals, regenerated alveolar structure does form in steadily increasing quantity. This can only mean that the original pathogenic area has been eliminated, and that there has been no recurrence of infection.

We are peculiarly unhappy in having a certain amount of pseudo-scientific work brought to our meetings which could not stand the test of scientific corroboration. It is especially wrong to take up our time with roentgenograms showing such poor detail that it is absurd to listen to the interpretations conjured up by the imagination of the presenter.

It is with keen regret that I realize that I can not take up a couple of hours of your time in showing you the value of good roentgenograms as corroborative evidence.

For over a year I have been collaborating with Prof. Gies and Dr. J. Levy in research work on ionism.

You all know the thoroughness of any work engaged in by Professor Gies, and he says this is the most difficult problem he has undertaken. We have no scientific report to make at this time, except perhaps to state that the result of our work so far tends in every way to make us believe in the elimination of micro-organisms when the current is used in sufficient quantity. This does not mean that fresh infection will not take place and it might be added that we are engaged in this work with open minds.

I should like to ask Dr. Sturridge a few questions on matters regarding which I feel that further discussion by him would be enlightening.

Has Dr. Sturridge, or any one else, shown by direct comparative experiments, how much faster and farther ions travel in biological matter when driven by the electric current than when propelled only by osmotic forces?

Is it correct to say that the electric current, as used in ionic medication, "*produces*" ions rather than that the current is *carried* by ions?

Is argyrol an ionizable substance (an electrolyte) or a non-ionizable colloidal product containing protein and combined silver?

In discussing the action of the current, and after alluding to events at the positive pole, Dr. Sturridge says that potassium and chlorin are formed at the negative pole. Why potassium? He says chlorin is repelled from that pole into the tissues. How can potassium ions under such conditions unite with water? Does

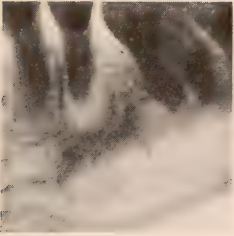


FIG. 1

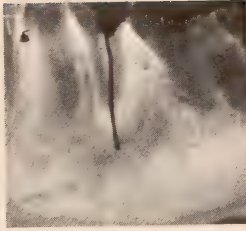


FIG. 2

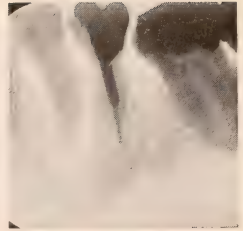


FIG. 3



FIG. 4

Roentgenograms presented by Dr. Rhein showing regeneration of bone following ionism and proper aseptic root canal filling

Dr. Sturridge mean to suggest that potassium is converted first into molecular (*i. e.*, metallic) form and then reacts with water to yield potassium and hydroxyl ions in solution. What becomes of the chlorin while the potassium reacts with water?

If platinum were used instead of zīnc as the positive electrode, what would become, and what would be the effect, of the oxygen and chlorin which Dr. Sturridge says are liberated at the positive pole? If platinum were used, then zinc chlorid 3 per cent solution should be made use of instead of sodium chlorid.

Does Dr. Sturridge know it to be a fact that *metabolism* is stimulated or benefited in the parts affected by ionic medication, or has he inferred such benefit by analogy?

Does Dr. Sturridge know positively that bacteria which have been killed by ionic medication are *absorbed* into the general circulation and there act "much in the same way as vaccine therapy"? Are these bacteria carried into the blood stream before disintegration and before the local digestion of their protein constituents? Has Dr. Sturridge any experimental evidence on any of these points?

As regards ionism in pyorrhea, it is impossible to follow the essayist, believing as I do that the malnutritional factor in each case is the important matter upon which all treatment must vary, according to the nature of the particular case.

Not that I mean to belittle the value of ionism in certain cases, but the time has long since passed when pyorrhea can be intelligently discussed without specifying the form of malnutrition which makes such a condition possible.

Many of us heard a presentation of this subject last night in Brooklyn, where contentions were made from the standpoint of Dr. Price in opposition to everything I have said. Dr. Price is entitled to his individual opinion, and nothing more. As long as the work of other men results in contrary results, the subject is in a condition where it requires corroboration. One of the things Dr. Price spoke about was the defective quality in gutta-percha as a root-filling material, bringing out a theory that was unique in its originality, but which unfortunately fails to stand the test of roentgenographic evidence of such pictures as are

examined with the aid of a magnifying glass. Because when we can show gutta percha fillings that have been in the roots of teeth for thirty years, and the highest magnification fails to detect any space between the filling and the periphery of the canals, it is the greatest proof against the theory of Dr. Price that could be presented.

There are cases shown continually, where it is not difficult, even with the naked eye, to see the imperfect gutta percha root fillings; but why blame gutta percha for the lack of proper technical skill of the man who inserted the filling?

Dr. William A. Spring.—I have listened with intense interest to every word of Dr. Sturridge's paper, because I believe thoroughly in ionization. I believe I have obtained a good many beautiful results by its use, which I certainly could not have gained by any other method.

I began using cataphoresis at the time it first became known, and even to-day find with about six minutes application, I can drive the ions—as the process is now described—of cocain into the tooth, and get an effect which will render an exceedingly sensitive tooth easy to operate upon.

In the use of root ionization, by best results have been obtained in treatment of chronic fistulæ, and I will describe two cases which appeal to me as being especially good proof that it is an effective remedy.

In one case, an upper molar had had a crown for twenty years, and during the whole time a fistula existed. Whenever the patient got cold, a very large amount of ulceration took place. After the first application of ionization, the fistula nearly closed, and after the third, it closed forever. I have had an opportunity to watch it for some time, and I am convinced that that fistula will never return.

Two lower molars, in the case of a lady, had had a serious fistula for twelve years, the exuberant granulation being as big as a pea. After the first ionization, the tissue was reduced three-quarters; and after the third, it disappeared entirely, the fistula itself closing shortly afterward. In my practice I do not know

how I could accomplish that with any means other than ionization.

Dr. Sturridge did not mention one thing I have found important, and that is, that a moisture at the end of a root which is ready to fill can be quickly stopped by five minutes of ionization.

I have found in my work that the 3 per cent. chlorid of zinc has been thoroughly satisfactory. I have tried the other method, and the only difference I can see, is that, if I am using the salt solution instead of the chlorid of zinc itself, a slight wait is necessary before the formation of the latter. As I understand it, Dr. Sturridge explained that chlorid of zinc is formed. He denied that it is passed through the foramen, though present in every case.

In my opinion, unless more than one-half a milliamperé is used, there is no wearing away of the point, for depending upon a small current, there may be lack of power if the salt is made use of.

I believe Dr. Sturridge is quite correct when he says ionization hastens the cure of pyorrhea. We are all aware that in cases of pyorrhea there is a congestion, a sluggishness in the circulation. We also know if we remove the deposits, until there is nothing of that sort left, and all necrotic tissue, that, provided faulty occlusion and impaired strength of the patient are not hindering, we get good results very quickly.

To-day I believe skilful specialists in this kind of work are coming more and more to the opinion that the use of strong drugs is of little value; and I think we get a good result whether we use anything more than the spray bottle disinfectants, or not.

However, in a case of pyorrhea which has been apparently restored, especially a case which has needed a number of hours to bring to this state of rosy health, where pressure upon the gums results in no appearance of pus and the condition of the mouth seems good, in my experience I am still obliged to see the patient at the end of four weeks to prove my results. And invariably, if the case has been a bad one, I find tartar practically everywhere that it had been before.

I am able, after a short time, to extend my periods, and after a while that patient can go on the basis of six months. I have

found that these periods are lengthened more rapidly, and I can arrive more quickly at the interval I consider normal, if ionization is used. I consider in my practice that a patient who can go six months before appearing for prophylactic treatment, and who in that time has collected only a small amount of tartar and has developed no trouble with the gums, is a normal case. I believe it is the duty of the dentist to study carefully each case that comes to him, and treat often enough to save the patient from pyorrhea, for I practised many years where there was no specialist, and where it was the duty of every practitioner to take care of those cases.

Dr. Sturridge explains that the use of the current destroys bacteria, and we will recognize without any explanation on his part, that the current must act as a stimulation. It appeals vividly to my imagination—the idea Dr. Sturridge presents—that the bacteria are destroyed in the gingival trough, and those destroyed in the tissue are absorbed, and have the opportunity of acting as anti-bodies and raising the opsonic index in the individual.

Dr. Sturridge has made the statement that this occurs, but I would like to repeat the same question Dr. Rhein put, and ask him how he knows that? Does he know it, and how does he know it? Can he offer us proof?

I should ask him if he has ever made blood tests, or has had them made, to know whether the opsonic index is raised by ionization.

I want to say that I know from reports I have had from time to time from prominent London practitioners, that Dr. Sturridges's work in ionization has been conspicuously successful in London. I want to give him that tribute.

Dr. Henry W. Gillett.—I feel we should congratulate ourselves on having had this opportunity to hear Dr. Sturridge on this very important subject, and on hearing the discussion his paper has so far brought out.

I am going to limit my remarks to a rather narrow field and say nothing at all about pyorrhea. First I will refer to a few minor points that I conceive may be helpful to men who may be stimulated to take up the practice of ionization as the result of what they are hearing to-night—a few words in the way of cau-

tion concerning the technic. It is almost impossible for the practitioner who has not used the galvanic current in the way that it should be used in ionization, to realize how readily that current will escape by other paths than the one he desires to have it follow. That means that if there is a wet surface at the margin of the cavity due to the least bit of leakage of moisture under the rubber dam—the chlorid of zinc, or other electrolyte will probably join with it and provide a path for the current to reach the gum instead of going either through the foramen or the wall of the tooth, as Dr. Price has indicated by the measurements he has made in his research. If there is opportunity for the current to reach a gold inlay, a gold filling, or a gold crown, that is in contact with the gum, that is the path it will take. You must insulate all possible paths except the one you wish your current to follow. Learn to distinguish accurately the positive and negative electrodes; the + and — marks on your machine only indicate the way it is intended to work. Reversal of a plug results in exchanging their values. Learn which pole to use with any selected electrolyte.

It seems to have been reliably demonstrated that electric ions do penetrate the tissues. It has been shown that in many instances there follows that treatment a growth of new bone by which previously radiolucent areas are filled in and disappear in so far as we can detect by roentgenograms. There is a question as to why this happens. Dr. Sturridge, Dr. Rhein, and, I think, Dr. Levy are convinced that it happens because the zinc or other ions destroy bacterial life in the granulomatous tissue. A number of other men have made earnest and careful efforts to demonstrate bacteriologically that this sterilization actually happens.²

So far as I have learned, they have not succeeded in the effort to prove it. As I understand Dr. Sturridge and Dr. Rhein, they are depending upon clinical evidence for support of the theory.

Dr. Rhein.—No, bacteriological evidence.

² Note.—Dr. Levy has asked me to correct this statement as follows: Dr. Rhein, and I believe Dr. Levy, are convinced that ionic medication induces some change in the infected periapical tissue, which brings about a more or less rapid regeneration of this tissue. Careful experiments have demonstrated to their satisfaction that it very markedly reduces the quantity of bacteria present, if it does not entirely obliterate them.

Dr. Gillett.—If there is bacteriological evidence, I will be glad to learn of it. Dr. Rhein has told us this evening that he has experiments under way, on which he is not ready yet to report. I have known of these, and have been asking him repeatedly when he could tell us about them. I will correct my statement in this way, that I believe there are no published reports supplying bacteriological evidence that ionization sterilizes granulomatous tissue.³

I now want to ask a question. Can anybody explain what has happened in the way of repair after certain old processes we have followed, i.e., when we used to force a strong cauterizing agent through a fistula and follow it with chloropercha till it emerged from the fistula? I ask this because I have been searching for such reports. Has anyone any roentgenographic evidence to show us what reparative sequelae have followed that treatment?

Has anyone any satisfactory explanation of what has happened in cases where chloropercha or gutta percha has been forced out into granulomatous tissue without any ionization? If I am not misinformed, Dr. Berger has shown some slides in which there is evidence that under that treatment, regeneration of bone has taken place. I was very much surprised myself, on taking a final roentgenogram in preparation for performing an apicoectomy on a right superior bicuspid with a known history of granuloma of two years standing and probability of a much longer period. I had been depending on a roentgenogram two years old and the decision to operate was rather sudden.

The case history was that of a neurasthenic patient, threatened with a mental breakdown, and consequent need for quick and simple treatment. A paraform dressing was sealed in the tooth for about eight hours; for a few days following, it had an ordinary carbolic acid dressing and the root was then filled by the process recommended by Dr. Nies, of Brooklyn.

³ Since the above statement was made, I have been able, in one case, to induce disappearance of streptococcus viridans following zinc ionization. Cultures before ionization, immediately after and four days after developed the organism. Sterile paper points only were used as dressings in the canal. Eleven days after the last positive culture, another gave negative results, and two subsequent cultures have been negative.

This case tends to support the hypothesis that the curative influence is induced by stimulation of vital activity in the tissues rather than by direct influence on the organisms.

It was a varnishing of the canal by an impermeable, insoluble varnish, akelitt varnish, plus a gutta percha cone which I found extended into the granulomatous area about one-sixteenth of an inch.

The tooth gave no further trouble and later on it had a crown placed on it. On recent digital examination, the patient's sensations indicated continued presence of granuloma. Last week, a new Roentgenogram showed an almost complete filling of the granulomatous area, with what appears to be sound bone. What induced that result? If we can discover the explanation for this and similar cases perhaps we may find a simpler way to obliterate radiolucent areas than the practise of ionization.⁴

It seems to me we need a great deal more research of the type that is now being conducted, before we shall have the complete explanation. In my estimation, clinical evidence is one of the most deceptive things known to the human mind.

I trust Dr. Rhein will shortly set before us a technic that can be checked up by other scientists, and we shall have distinct demonstration of the reason for the repair, instead of our present dependence upon interpretation of clinical evidence. .

I was a good deal surprised at the current strength that Dr. Sturridge speaks of, in the treatment of granuloma. Personally, I am unable in most instances, to use any such strength as from three to five milliamperes. I find fully as many cases in which I cannot use more than three-fifths of a milliampere, as I do cases in which I can use one milliampere, and for a quite long time the latter has been the limit of current strength I have dared employ in any granuloma case. The reason I am unable to use larger dosage, is that I find altogether too much irritation with many patients at the time of use and too much subsequent soreness. Dosage should be influenced by the size of the foramen, and the condition of the tissues around the root apex. Unduly heavy currents are liable to result in the breaking down of too much tissue. I would suggest to those of you who are going

⁴ Possibly the explanation for these cases may be allied to that referred to in the previous note, viz., that sterile mechanical irritants also serve to stimulate vital activity and induce reparative processes in granulomatous areas.

to begin the practice of ionization that you be conservative in your application of current strength and time, till you have tested results.

I just want to put in a final word, which does not bear strictly on the subject of this paper, but yet is so closely related that I feel no discussion of this sort should pass without emphasis being laid on the technic we are following to-day in our root canal work and its influence on all the correlated subjects that we are discussing with so much interest.

Our subject to-night deals largely with infected pulpless teeth. When are we going to stop having this continuous crop of infected pulpless teeth? We will reduce them by fifty, eighty, ninety per cent. when the dental profession learns to practise asepsis in its root canal work—real, genuine, thorough asepsis—the kind that permits no instrument, no absorbent material, nothing whatever, to pass the entrance of the cavity in a pulpless tooth, which would not be permissible to pass the entrance of a wound in your own abdomen, if you were having a laparotomy performed.

Dr. Berger.—I did not expect to be called upon this evening, and am hardly prepared to add to the interest of the paper under discussion, as I know very little about ionization.

I shall take the liberty, however, of proffering some answers to the questions of Dr. Gillett, pertaining to the subject of granuloma.

It seems to me that a great deal of unwarranted importance is being attached to the tissue proliferations—so called dental granuloma. It is a well known fact in pathology that a limiting membrane forms about a chronic suppurative area. This is equally true of abscesses located at the apices of devitalized teeth. The dental profession paid very little attention to this, until it was made more significant by the imputed malignant nature of these tissues. The truth is, that it is merely a manifestation of tissue reaction to injury, which may be of a reparative or of a protective nature, or both. This process or phenomenon, when located at the apex of a tooth, is the result of a productive inflammation, which is induced by the bacterial or bacterio-chemical

irritation which proceeds from a decomposing pulp, but has no other pathological significance than when similar conditions obtain in other parts of the body.

It is true that the granulomas may differ or that they may assume different forms. Some are dense and some are hollow; others undergo a cystic degeneration; they may differ in their histological structure. These variations, however, in my estimation do not alter their identity or their pathological significance.

It is not likely that granulomas develop in cases of acute abscesses, but they will be found almost invariably, in association with chronic abscesses.

As to what becomes of this tissue, assuming that the source of infection, the decomposing or decomposed dental pulp, is removed, the factor inciting this tissue growth is eliminated. If its function is protective, with the removal of the source of infection, its function is discontinued, and it is eventually resorbed; or some parts of it may undergo ossification.

Dr. Joseph M. Levy.—Dr. Gillett wanted to know what happened when we irrigated with sulphuric acid through an abscess with a fistulous opening. When you have a fistulous opening it is easy for the tissue destroyed by the acid to be thrown off through this opening. If you had a blind abscess and filled that up with sulphuric acid you would have a different condition wherein it would be almost impossible to slough off the tissue destroyed by the acid.

Dr. Gillett.—I did not use the term sulphuric acid. I referred to the old practice of 95 per cent carbolic acid with chloro-percha, with the emphasis on the chloro-percha, rather than the carbolic acid.

Dr. Levy.—If the solution had an escharotic effect, the difficulty would be the same.

I did not come here as a critic of ionic medication because I believe in and practice it. My reason for discussing the paper this evening is to try, if possible, to prevent our forming incorrect conclusions in regard to its action.

Up to the present time very little research has been done to discover why or how ionization does its work. What I par-

ticularly want to guard you against is the acceptance as facts of the different conclusions that have been drawn by the essayist where these conclusions are not substantiated by scientific proof.

Dr. Sturridge told us of the ferrous-sulphate test he made. Unless he checked up this experiment with an osmotic control he has no right to presume that it was purely the passage of the current that forced the ferrous ion where he found it. If you make this test by diffusion you will also get Prussian blue. Using ionization with a ferrous sulphate solution, to demonstrate that only the ferrous ion passed, it is necessary to test for the sulphate also. Failing to get a result for the latter, you may then claimed that it was the ionic effect you had obtained. If sulphate should be present, then the ferrous ion went where it did simply by diffusion.

In a conversation with Dr. Sturridge, he told me that he held the belief that your medicament radiated in all directions from the pole at which it was being applied. How then can he concentrate it?

Dr. Sturridge spoke of antiseptic ions. Antiseptics *do not destroy* bacteria but only inhibit their growth. I would like to know what tests he has made to prove that ionic medication *destroys* bacteria.

In regard to Dr. Sturridge's obtaining the silver ion from Argyrol, I do not believe this is possible. I do not believe colloidal substances can be ionized. Were this possible, we could ionize the iron from the hemoglobin in the blood.

We have been told that we sometimes get burns at the *negative* pole and that these burns are caused by caustic potash which is formed at this pole. Dr. Sturridge drew us a diagram to explain how this formation of caustic potash occurs. He said that the potassium combines with the watery element in the tissues to form this caustic potash. This deduction I believe to be incorrect. In the first place, potassium would have to be produced in its metallic state before it could enter into such chemical combination. How would it be thus produced? Secondly, caustic potash is KOH; therefore the water involved must be split up in order to get rid of one of the hydrogen atoms. If this were

done, hydroxyl, which is an electro-negative radical, would pass toward the anode and there yield oxygen, and as potassium is electro-positive, it would pass toward the cathode. How then would these two parts get together and remain together?

Dr. Sturridge's own statement as to the propelling action of the current on these substances demonstrates the fallacy of his deduction as to the formation of caustic potash.

In ionic medication with zinc ions, I believe we should use a zinc chlorid solution and not a sodium chlorid solution. As we want zinc ion, why not take it where we will find it in greatest abundance. When you use a zinc point and zinc chlorid solution, the amount of zinc chloride in solution is maintained near the desired maximal concentration. The passage of the current separates the zinc and the chlorin, the zinc ion passing toward and into the tissues and the chlorine being attracted to the zinc point used as the anode. Here the chlorin enters into combination with zinc to yield more zinc chlorid, which immediately goes into solution and replaces that previously removed. Thus the amount of zinc chlorid in your solution remains relatively constant.

The essayist tells us that ionization destroys the life of the microorganisms present and that these dead microorganisms are then absorbed into the system and are practically autogenous vaccines. Until we are presented with positive proof that ionic medication has bactericidal action without splitting up the complex protein combinations of which these microorganisms consist, I believe it wise for us *not* to accept this theory. Personally I do not think this belief is tenable.

While I agree with the essayist in believing in the efficacy of ionic medication I cannot agree with his deductions as to how its beneficial results are obtained. I am inclined to the opinion that its results are obtained through the induction of autolysis. If we stimulate the concentration of enzymes by ionic medication and then have a digestion of the microorganisms and a complete change in their protein combinations, if the theory of autolysis is correct, how then can one get an absorption of dead microorganisms that will raise the patient's immunity?

If Dr. Sturridge's theory were correct, in those cases of pyorrhea in which he treated all the pockets with ionic medication at one sitting, he would have induced an absorption of massive doses of these dead microorganisms he speaks of and would necessarily have obtained marked reactions. Those who have been following vaccine therapy know that some patients show a marked idiosyncrasy to this form of treatment (vaccine therapy) and in them anaphylaxis results from its use; yet we have no record of any such condition following intensive ionic medication.

Dr. Kauffer.—The Essayist and the other gentlemen, in their discussion, apparently vary in their opinions, as to the value of ionic methods. We know a galvanic current induces hyperemia, and Beir has shown that hyperemia is indicated in treating septic areas. Dr. Price tells us he "has seen some men use the negative pole, and some the positive pole, that some use platinum points and others zinc, yet they all get the same good result." They all get hyperemia.

Dr. Levy says ionization "encourages the concentration of enzymes"; so also does hyperemia.

Gentlemen, I believe it is the hyperemia produced during the treatment with ionization, or with the galvanic current, that is of value, and if this be true, we can induce a hyperemia by very much simpler methods, and save much time, both to the practitioner and to the patient.

Dr. Rhein.—I just wanted to say something about the concentration of the current which I hoped Dr. Levy would bring out. I mentioned it in my paper, but it seems to have been overlooked. In the original article in which I spoke of the electrolyzation of zinc, I distinctly referred to the point of bringing the anode through the end of the root. Dr. Price said something about that, and it is a simple thing, in my belief, to concentrate the current in various ways. If the apical foramen is open wide enough, and I want to divert the current from going through the side of the root, I can line the root with a solution of chloropercha which acts as an insulater, and causes the current to pass through to the end.

In the article I wrote in 1897, I emphasized passing the current through to the pathogenic tissue.

Dr. Sturridge—(closing the discussion) I do not think it possible to answer all these questions individually in the short time at my disposal tonight, but I shall endeavor to reply to all those of important bearing on the subject.

Dr. Rhein wants to know if the current is conducted by ions, or if the ions are driven by the current. I think I mentioned in my paper that there can be no conduction in any electrolyte without movement of ions. The electric current splits the elements and forms the ions which are the conductors and conveyors of current. There is nothing in that which requires any special explanation. If we did not have moist tissues to conduct through, no current would pass at all, for it is conducted by the movement of the ions in the direction of flow of current.

As to argyrol, I have been using it for treatment of gingivitis and stomatitis for some years. It is said that colloid substances do not ionize. I took the trouble to get the opinion of several men in London on this point and Parke Davis & Co.'s expert told me that argyrol does ionize slightly. He has had the ions move with argyrol, and I think it rather makes the theory that colloid preparations do not ionize an uncertain one.

I have recently taken care of one of the worst cases of stomatitis I have ever seen, which had been treated with everything possible for six months previously without the slightest effect. The mucous membrane was loose in large patches from last molar to last molar, and could be readily stripped off in large pieces. I treated the condition with ten per cent. argyrol and fifteen milliamperes of current, as the patient was an old man and the mucous surfaces of his mouth seemed to have little feeling. In about six weeks a complete cure of this case was effected by ionization with argyrol alone. This is an instance where clinical evidence is strongly in favor of the possibility of ionizing with a colloid substance. I have used argyrol many times in treating stomatitic conditions of the mouth with results that I consider highly satisfactory.

About the platinum wire instead of zinc, as the electrode; if

chlorid of sodium solution is in a root and a platinum point instead of a zinc point is inserted, there would be no zinc ions, as we would have sodium ions. I have doubts regarding zinc ions forming to any extent; when a zinc point is used in a root canal with saline solution, it is better technic to use a solution of zinc chlorid or sulphate and either a zinc or platinum electrode.

As to the other question Dr. Rhein asked, I have no definite proof. I think Dr. Rhein has more proof than I, because he takes such wonderful skiagraphs of the teeth after ionization, and he says the bone reforms and the metabolism is therefore affected by the treatment.

He asks if I know positively that the bacteria have been killed by ionic medication and absorbed into the general circulation. I can only guess at that, and I have no proof whatever; I have inquired of specialists in vaccine therapy who practise in London, if bacteria killed in the tissues by ionization during pyorrhea treatment would affect the immunity of patients, and they have said they thought that very likely. Similar inquiries made in Paris were answered in exactly the same way.

Several gentlemen are anxious to know whether ions really pass through and sterilize the granuloma. They take exception to the fact that only clinical evidence has been given. It is not all of us who are blessed with the time or the talent to do experimental work to the extent of tabulating and bringing before the profession such work. It would require a great deal of work and time to bring evidence to prove that bacteria were killed in the root of the tooth and in the granuloma. Clinical evidence I consider very strong evidence. I notice that in nearly all the cases brought forward in the first and most valuable work on ionization, by Dr. Lewis Jones, written about two years ago, that he seems to attach more value to clinical evidence than to anything else, and that he constantly brings it forward.

What struck Dr. Leduc years ago, was that when he put an electrode saturated with strychnin on the ear of a rabbit without the passage of a current, it had no effect on the animal; but when he passed a current from the positive pole through the strychnin, in a short time he poisoned the rabbit. He relied on

this clinical evidence to show that ions of strychnin had moved and entered the tissues. There are numerous cases of that kind which show that scientists rely a great deal on clinical evidence to the exclusion of direct experimental work.

As to the movement of the colored ions, in the experiment with ferrous sulphate, I do not believe the ions would move or penetrate the tissue to any depth at all, if the solution of the salt were used without the aid of the current which dissociates the ions and causes a movement in a definite direction penetrating to a certain depth.

Dr. Levy.—They were actually drawn through the enamel.

Dr. Sturridge.—It must have been in for a very long time. In a minute, or a minute and a half, you can penetrate the canaliculi and saturate the tooth. It is an element which would move away from the positive pole, and would be expected to penetrate much deeper with the current than without.

It is difficult to answer Dr. Price at all. He went far beyond the scope of my paper. He said he was able to extract bacteria from tissues treated by ionization. I think there are many mistakes made in the technic of ionization as originally there were with cataphoresis. We used to think we could use any medicament—carbolic acid or anything and drive it into tissue en masse, but the lines along which ionization is now used, are guided by scientific knowledge, by rules in electro-physics. We know that certain ions move in certain directions; if they are antiseptic or germicidal, we would expect they would have an effect on the bacteria in the tissues, and certain clinical evidence goes to show that they do have an effect.

In some root affections, it seems impossible to find an antiseptic dressing which, when sealed in the root canal, will act adequately to reduce inflammation and formation of gases. Often it is impossible to seal the canals for longer than twenty-four hours without the patient suffering pain. I have seen cases of this description relieved after being treated once with zinc ions. Why should they not go on giving trouble if the ions had no effect? That is clinical evidence which cannot be ignored. I feel perfectly safe in ionizing root canals before introducing

root fillings and with the technic advised by Dr. Rhein, one feels that every precaution has been taken and clinical results certainly justifies this method of procedure.

Dr. Spring spoke of the value of clinical evidence. He said he had had a great many good results, and agrees with me that results obtained by ionization warrant the practise of this method in many cases.

Dr. Spring asked about vaccine therapy. I do not know. I have asked men who practise that therapy, whether killed bacteria would be absorbed in the general circulation, and they thought they would.

As to the action of the potassium in the negative pole, it is not of much vital importance and was referred to in order to complete the illustration of a cell in comparison with the body. The potassium ions, being electro-positive, when dissociated at the negative pole are not driven away from the pole; they are free, and if they have an affinity for certain elements, they will unite in the same way as oxygen, being free at the positive pole, will unite with the zinc. The caustic soda is an effect found at the negative pole so often that it is referred to in medical works as one of the things that is formed. It is one of the only chemical actions that take place at this pole, and reference to it was only made on account of the fact that blisters are sometimes made by the indifferent electrode when ionizing.

Dr. Levy.—The minute the molecule is split, it cannot enter into this combination.

Dr. Sturridge.—Why not?

Dr. Levy.—You cannot get caustic potash without your hydrogen. You are driving it in a different direction.

Dr. Sturridge.—It could be free in the tissues, and capable of chemical combination with elements in the tissues for which it may have affinity.

Dr. Levy.—But it is going in the opposite direction.

Dr. Sturridge.—I do not think it is going in the opposite direction; it is simply dissociated and free to act chemically as described. I take a great deal from medical experience and have profited often by experiments worked out by others from a

medical standpoint, because a busy man cannot do all those things himself. I think, however, I will be able to work this out for you, and give a more satisfactory answer. I am told that caustic soda is formed at the negative pole, this I think being the opinion of Dr. Prinz.

Gentlemen I thank you for the very kind way in which you have received me, and the great interest shown in this subject which I trust may be of some real benefit to you.

Adjournment.

WILLIAM J. LEDERER,
Editor, First District Dental Society.

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EDITORIAL DEPARTMENT

DENTAL MALPRACTICE SUITS

The marked tendency to increase in dental malpractice suits to which Dr. Palmer calls attention¹ is evidence of a disturbed equilibrium between the public and the dentist of to-day. The physician, who daily decides questions of life and death, is not so threatened with the law on every hand, should he be remiss in skill or judgment. Partly, it may be said, this is due to the fact that insomuch as death must overtake us all at some time, the physician being the court of last appeal, a case lost may be the inevitable triumph of Nature over fallible man. Therefore, the

¹ Palmer, B. B., Jr., *The New Era in Dentistry: Its Relation to the Increase in Dental Malpractice Suits*, p. 1, this number of THE JOURNAL.

physician is expected to fail in his ministrations, more or less. There is the further reason that the errors of the physician may be buried with the patient, or, in the case of recovery, frequently are not traceable owing to metamorphoses due to vital stamina which saved the day for patient and for physician.

The dental practitioner's mistakes are not "writ in water," but persist, visible and demonstrable, in bony tissues slow of structural change. The X-ray reveals facts, clear as the printed page, and these records, while often extremely faulty, have great weight as direct evidence. The dental practitioner, until recently, has been accredited by the public with so limited a field of usefulness, that failure of any kind on his part involving serious consequences to the patient, is more apt to create suspicions of carelessness or incompetence than would a similar circumstance with the medical practitioner. The broader training of the physician entitles him to the benefit of a doubt, and the nature of his life's work is one in which the border-lines of personal responsibility are but vaguely marked.

The present day aspect of dental science as an important department of medicine, the ease with which results in dental surgery may be recorded, and above all a form of hysteria in recent years on the part of the public concerning the enormity of dental disease of any kind—all these factors place the dentist of to-day in a position which is precarious from one point of view, but which, from another, should stir him as a call to greater things.

First and foremost stands the absolute need for broader preliminary, and of more thorough advanced, undergraduate training. Postgraduate teaching, of unquestionable authority, will help immeasurably the thousands of practitioners now more or less set in the narrow routine of older methods. Secondly, where all men live in glass houses the reputation of the individual is the more respected, and the instinct for charity and justice

quicken—*not* merely, let us hope, because of compelling considerations of policy.

The public is easily thrown into temporary panic, but the popular estimate of men and their work is likely to be just in the end. In meeting squarely our growing responsibilities by setting about in every way to qualify for them, the public estimation will not be withheld; our labors will be honored, not beset with legal dangers. The malpractice evil of to-day is a blessing in disguise. It will hasten a new and better order of things, and vanish when the practice of dental medicine and surgery has indeed been carried to the plane of our best knowledge.

A SCHOOL OF ORAL HYGIENE

The present dental law of the State of New York recently enacted, provides that "any dental dispensary or infirmary legally incorporated and registered by the regents, and maintaining a proper standard and equipment, may establish for women students a course in oral hygiene." It is provided further that the minimum entrance requirement for the student shall be one year in a high school, that the applicant must be at least twenty years old and of good moral character.

In anticipation of the need of a school for the training of hygienists, committees appointed by the First and Second District Dental Societies met in early summer, 1916, to consider ways and means. Later a coöperative arrangement was made by the joint committee and Dr. Louise Ball, who had organized a school to be run under the auspices of Hunter College. A preliminary summer session was begun in July, in which students received their classroom instruction at Hunter College, and clinical instruction at Vanderbilt Clinic, College of Physicians and Surgeons. Before the beginning of the first regular session in October, Hunter College withdrew, and classroom facilities

were secured at the De Witt Clinton High School. At the present time a class of 95 young women are making excellent progress as shown by recent mid-term examinations. We are informed that the Board of Managers of Vanderbilt Clinic have expressed their willingness to make the School of Oral Hygiene an integral part of its institution, and this consummation is looked for in the near future.

During the academic year of 32 weeks the hygienist is taught the broad principles of physics (applied to the needs of a dental clinic), dento-chemistry, pharmacology, dental and oral anatomy and histology, occlusion, dietetics, dental pathology, physiology, hygiene, dental prophylaxis, surgical asepsis, institutional dental hygiene, and minor allied subjects. A large part of the working time is devoted to practical work on manikin heads and clinic patients. Well-known practitioners, specially qualified in their various subjects, have served as lecturers, and the administration of the school has been carried forward smoothly and efficiently by the dean, Dr. Ball. Considering the difficulties always inherent to the establishment of an educational institution, the first year of this school of hygiene has been a conspicuous success.

The dental hygienist in New York State is permitted to "remove lime deposits, accretions and stains from the exposed surfaces of teeth, but shall not perform any other operation on the teeth or tissues of the mouth." It is understood that the treatment of pyorrhea is not within her function. The demand for such service in private practice has become insistent in recent years. Frequent and systematic cleansing of the patient's teeth is at the bottom of successful practice, but the time required consistently to carry out such a program is so great that it amounts to a serious handicap in the day's work. Fortunately this time-consuming procedure may safely be delegated in the way now provided, and the dentist may devote his best energies to details which cannot be placed in other hands.

Still broader in her field of usefulness will be the institutional nurse, who instructs the child in that vastly important habit of mouth cleanliness at the only age when it may be effectively borne in upon the human mind or conscience. The only means of teaching our hundreds of thousands of school children will be in her hands, and her kindly and suggestive ministrations will be a powerful factor in awakening the young mind to an appreciation of what mouth cleanliness is, and how simply it may be produced. The dental hygienist is destined to become indispensable in preventive medicine. As an economic necessity she should be welcomed in every community.

CURRENT DENTAL LITERATURE

COMPILED BY ARTHUR H. MERRITT, D.D.S.

Titles marked with an asterisk (*) are abstracted briefly.

Boston Medical and Surgical Journal, *December 14, 1916.*

- 1 **Some of the Clinical Evidence Relating to the Etiology of Epilepsy, Including Some Notes on the Condition of the Teeth as a Factor in Production, Etc.** Hale Powers.

In an examination of fifty cases of epilepsy, ranging in age from three and one-half to sixty years, the author found 80 per cent. to have bad teeth and is of the opinion that there is a direct relationship, and that in the treatment of the majority of these cases, the dentist, rather than the surgeon, should be consulted. The statement is made that when there is difficulty in making a diagnosis between epilepsy and hysteria, or between epilepsy and intercranial tumor, a bad condition of the teeth with inability to properly masticate, should be regarded as evidence in favor of epilepsy.

Dental Cosmos, *December, 1916.*

- 2 *Some Important Causes of Periapical Infections. C. J. Grove.
3 Diagnosis and Treatment of Vincent's Angina. Report of a Case Involving the Lungs. T. P. Hinman.
4 A Clinical and Experimental Study of Chronic Alveolar Abscess in Relation to Systemic Disorders. T. L. Gilmer.

2 **Some Important Causes of Periapical Infections.**

As a result of investigation and study of so called periapical infections, Grove expresses the belief that they are caused in many instances by the use of formaldehyde preparations in root canals, and unsparingly condemns the use of all pastes containing formaldehyde. His experiments were performed on dogs, an effort being made to carry on the treatments as nearly as possible as would be done in office practice. Many photomicrographs showing pathological changes in the pericementum of the apical space are submitted in proof of his assertions. The use of cresol with formaldehyde in no way minimizes the danger. Similar changes were also noted following the use of sodium and potassium. Violent inflammatory reactions were produced in the pulps of healthy teeth by the use of Buckley's desensitizing paste, convincing the author that such pulps never again become normal. A word of caution is sounded against the use of sulfuric acid in enlarging root canals, though it is believed that no injury will result if it is confined to the mouths of such canals. More satisfactory results are achieved by the substitution of hydrochloric acid. No disturbances of the periapical tissues were noted following the use of "mild antiseptics."

Note. In reply to an inquiry as to what "mild antiseptic" he would recommend, Dr. Grove replied that the antiseptic referred to in his article was composed as follows: Chloral hydrate and thymol āā four

drams. Mix in warm mortar until liquefied; add alcohol, 20 minims. He states that after years of use by himself and others, it has been found both effective and safe. A 50 per cent. solution of hydrochloric acid is recommended.

The Dental Digest, October, 1916.

5 The Problem of Mouth Washes.

C. M. MacKenzie.

The author calls attention to the folly of using antiseptic mouth washes for the purpose of inhibiting the growth or activity of bacteria. They are not only ineffective, but are harmful in that they act as salivary depressants, diminishing the flow of saliva, and promoting stagnation in the mouth. Lemon juice is recommended as one of the best natural antiseptic mouth washes available. It may be used in the proportions of one ounce to six or eight ounces of water. Its use will not only increase the quantity and alkalinity of the saliva, but also the amount of ptyalin which, because of its solubility of starch, adds to the cleansing of the mouth and teeth.

The Dental Review, October, 1916.

6 *The Trend of Operative Dentistry. J. V. Conzett.

7 *The Present Trend of Crown and Bridge Work. J. H. Prothero.

6 The Trend of Operative Dentistry.

The statement is made that the trend of operative dentistry is in the direction of the restoration of the function of teeth in their varied relations; in the elimination of pain; in shorter and more esthetic operations and in a more careful observation of the rules of asepsis. This last is especially emphasized in the treatment and filling of root canals. The operation should never be attempted, however, without the use of the rubber dam. This done, the teeth should be washed with iodine, followed by alcohol. Only sterile instruments should be used. When roots are properly filled, the author has found many cases in which the cementum seals over the apical foramen. Nature makes no mistakes, and where proper conditions are reproduced, one may expect a sealing over of the apical foramen and permanent elimination of possible infections. The belief is expressed that when a pulp has been aseptically removed, and no irritating agent placed in the canal, that one may expect such sealing of the apical foramen. While one should be careful to fill the canal as nearly as possible, the perfect filling is of less importance than the preservation of asepsis, inasmuch as the apical foramen will be sealed in aseptic non-irritated canals as well if the root is not perfectly filled as if it is. An aseptic root canal not perfectly filled to the apex, is preferable to one in which the filling protrudes beyond the end, as such conditions forever preclude the possibility of natural healing.

Note. In response to an inquiry as to whether such sealing could be expected to take place in roots about which infection had taken place

previous to treatment, Dr. Conzett writes under date of December 4, 1916: "I am of the belief that when the pulp is thoroughly and aseptically removed, and no irritating substance is then placed in the canals, that the cementum seals over the apex of the root, and we have a permanently aseptic root as far as the interior is concerned. In case of infected roots, I would insist upon a perfect filling of the root canal to the apex, and would not decry the slight protrusion of chloropercha in those cases. By infected root is meant one that had been infected and has been placed in a state of health by treatment. In no other case would I tolerate a protrusion of the root filling. I had rather the canal was not perfectly filled in a tooth with a freshly extracted pulp than to have the filling protrude, to irritate the tissues at the apex and effectually prevent any healing which might otherwise occur."

7 The Present Trend of Crown and Bridge Work.

Modern crown and bridge work had its birth less than fifty years ago, the replacing of missing teeth by this method having originated with Dr. B. J. Bing of Paris.¹ Since 1885, progress in this field has been rapid. While the principle of bridge work has often been misapplied, the author expresses the belief that in well selected cases, fixed bridge work represents the ideal method of restoring missing teeth.

Cases in which fixed bridge work may be safely employed are, however, considerably fewer than is generally recognized. Inasmuch as imperfectly filled root canals foster infection, the greatest care should be exercised in the treatment of such teeth when used for bridge abutments, as the strain imposed by the bridge makes such teeth more liable to infection. The present trend in crown and bridge work is in the direction of conservatism.

Journal of the American Medical Association, September 16, 1916.

- 8 *The Prevalence of Chronic Mouth Infections and Their Management. F. B. Moorhead.
- 9 The Principles Involved in Focal Infection as Related to Systemic Disease. Frank Billings.
- 10 *Dental Infections and Systemic Disease; Treatment and Results. E. E. Irons.

8 The Prevalence of Chronic Mouth Infections and Their Management.

The author cites 718 cases to illustrate the incidence of chronic *mouth infections* in three groups of cases. All of the first group of 498 cases were chronic arthritics. Of these, 89 per cent. had *alveolar abscesses*. The members of the second group of 70 had chronic infections, none being arthritics. 74 per cent. had *alveolar infections*. Those comprising the third group of 150 were office cases, referred

¹ A description of his method may be found in The Dental Cosmos for 1869

for *mouth* examination because of some systemic disease. *Alveolar abscesses* were found in 69 per cent. It is believed that *pyorrhea* may be looked upon as the lesser of the two evils. The treatment of alveolar abscesses should be either conservative, directed toward saving the *teeth*, or radical, involving their extraction. Every tooth should be saved which may be made to serve the patient better than an artificial substitute, provided that the quality of the service be interpreted in the light of health and comfort. Conservative dentistry is urged when its objective is physical well-being. Saving *teeth* which perpetuate chronic infection is not conservative, but destructive dentistry. The chief object of dentistry should always be the maintenance of health.

10 Dental Infection and Systemic Disease; Treatment and Results.

While all metastatic disease is not due to *mouth* or *tonsillar infections*, the author expresses the belief that the preponderance of such lesions suggests that they may play an important part in the production of arthritis and similar diseases, and probably of certain types of cardio-vascular disease, not only valvular, but arteriosclerotic; also certain forms of nephritis. Under the sub-title of *Vaccines*, it is asserted that the practical results of vaccines as now administered, indicate that their value is exceedingly doubtful, and should never be used to replace or hinder the employment of recognized dental or surgical procedure. Under the most favorable conditions, vaccines could be only an adjunct to other treatment, which in mouth lesions, adequate surgical treatment by the dentist usually renders superfluous; for when proper surgical measures are carried out, the natural resistance of the body tissues, including those about the *teeth*, is usually sufficient. It would be futile therefore to substitute the use of vaccines for other well established modes of treatment. Regarding their use in *pyorrhea*, Irons says: "The same statement would appear to apply to the treatment of *pyorrhea*, in which the practice of injecting vaccines, as advised by those commercially interested in their production and sale, has led to absurdities as discreditable to the skill of the *dental profession*, as are similar practices so common in the past among physicians."

Journal of The American Medical Association, October 21, 1916.

11 Resistance to Infection.

Editorial.

Attention is called to the fact that infection is not determined simply because pathogenic organisms find lodgment in the body of a susceptible individual, but that it is necessary that the invading germ shall be capable of maintaining itself, multiplying and functioning within the new environment. An infection must be regarded as the product of two factors—invading germ and invaded subject—each factor itself influenced by a number of secondary modifying circumstances, and both influenced materially by such conditions as

number and virulency of organisms, their path of entry into the body and the environmental condition under which the struggle is maintained. It is probable that the power of the blood to cause agglutination, determines in large measure, whether the bacteria which have gained entrance are to be promptly removed from the circulation and septicemia avoided, or whether they are to remain and produce infection. The degree of agglutination and opsonization of bacteria, whereby they are mastered by the phagocytes, is inversely parallel to the infectiousness of many bacteria for the host. While these may be regarded as the decisive defensive forces in infection, they are not necessarily the only such forces.

Journal of The American Medical Association, October 28, 1916.

12 The Comparative Resistance of Bacteria and Human Tissues to Certain Germicidal Substances.

R. A. Lambert.

Recognizing that an ideal germicide for use on infected tissues of the body, is one that will kill the pathogenic organisms present without at the same time injuring the tissues, the author made comparative tests of ten germicides in common use, including mercuric chlorid, phenol, iodine, trichresol, hydrogen dioxid and alcohol. It was found possibly by the use of a solution of iodine of suitable strength, to kill organisms in infected tissues without affecting more than slightly the growth of cells. It was also found to be the only germicide used in the tests toward which living tissue cells were more resistant than bacteria. It possesses, moreover, the power of rapidly dissolving fibrin, which serves a useful purpose in plastering together wound surfaces, although this may militate against its use in some cases, such, for example, as open wounds. No harmful effect was seen from exposure of cells for one hour to 10 per cent. alcohol. The low bactericidal power of hydrogen dioxid was especially noteworthy.

Journal of The American Medical Association, November 18, 1916.

13 The Treatment of Malignant Disease About the Mouth by Combined Methods.

G. E. Pfahler.

Physicians are advised to give close attention to the mouths of their patients; to see to it that carious teeth and all pyorrheal lesions receive proper treatment; smoking should be prohibited in cases of leucoplakia and smoker's stomatitis; ulcers, fissures, crusts or warts that develop on the lower lip or at the angles of the mouth, and which do not disappear promptly, should be destroyed by electrothermic coagulation and should also receive Roentgen ray treatment locally and on the glandular area under the jaw. Careful attention to these prophylactic measures will accomplish much more than all the best known methods of the day. Four different methods for the treatment of malignant diseases of the mouth are available—surgery, electrothermic coagulation, roentgenotherapy and radium. The electrothermic method is advocated in cases in which the disease can be

destroyed locally, without regard to saving blood vessels or nerves, and where one can combine the local destruction of the disease in the mouth with the surgical removal of the diseased glands in the neck. Roentgenotherapy is of value in controlling the outlying cells or metastases that may be missed in the coagulation process. Radium is valuable chiefly in treating malignant diseases within the mouth, where the Roentgen ray cannot be applied. It is the author's opinion that any lesion about the mouth which does not show a tendency to heal within a few weeks should be regarded with suspicion and, in case of doubt, should be removed; that early lesions can be destroyed by electrothermic coagulation with less loss of tissue and greater success than by any other means; that deep roentgenotherapy should supplement any other method of destruction or removal of malignant disease; and that combined treatment by surgery, electrothermic coagulation, radium and deep roentgenotherapy will cure some patients who are otherwise hopeless.

Journal of The National Dental Association, November, 1916.

14 The Specificity of Streptococci.

A. T. Henrici.

Fifty three strains of streptococci from various sources were inoculated into 225 rabbits, and the virulence and elective organ affinities were compared with the powers of hemolysis and carbo-hydrate fermentation. It was found that the carbo-hydrate fermentation tests are of no significance from the standpoint of virulence and of doubtful significance from the standpoint of tissue localization. The hemolytic streptococci are more virulent than the non-hemolytic, but the two classes localize in the same tissues with equal frequency. There was no evidence produced by these experiments to justify the belief that any particular class of streptococci is specific for rheumatic fever, inasmuch as arthritis, myocarditis, endocarditis and myositis may be produced by some strains in each of the varieties and are produced in equal proportions by both hemolytic and non-hemolytic streptococci. As a result of these experiments as shown by microscopic examination, lesions were produced in the nervous system, heart valves, heart muscles, aorta, joints, voluntary muscles, lymph-adenoid tissues, kidneys and other tissues. Arthritis was the lesion most frequently observed, the knee being the joint most often involved, followed by the elbow, shoulder and small joints of the extremities. Heart valve lesions were found to develop usually by implantation on the surface of the valve.

New York Medical Journal, September 2, 1916.

15 Pyorrhea Alveolaris; A Review of 1,496 Cases.

J. A. Roddy, E. H. Funk, D. W. Kramer.

The authors (three physicians) express the belief that if *pyorrhea* did no more than to interfere with *mastication*, it would be serious enough to deserve the attention which has been given to it by the

dental profession, but an indisputable mass of evidence shows that complications of pyorrhea develop in remote portions of the body, which seriously injure or destroy important organs. Investigations which included an examination of 2,676 patients pointed to the fact that pyorrhea is more common among the tuberculous, than the non-tuberculous; that pulmonary tuberculosis predisposes to pyorrhea; that it is not greater among the syphilitic than among the non-syphilitic; that syphilis does not predispose to pyorrhea, and that neither nephritis nor diabetes predisposes to its development. Whether primary and secondary anemias are predisposing causes or complications of pyorrhea, is at present uncertain. The fact that they are frequently associated is significant. Few if any cases are caused by amebas. No particular species or group of organisms has been found to predominate in pyorrhea, and a specific etiological role can be ascribed to none of them. The total number of bacteria in *pyorrheal mouths* is always far in excess of those in normal mouths and "There is a distinct relationship between the bacterial flora of the mouth and pyorrhea," but no bacteriological distinction can be made between *oral sepsis* and *pyorrhea*. These conclusions have been reached after an examination of 3,000 cultures taken from the *mouths* of 200 normal persons, 100 *pyorrhea* patients, and 100 having *gingivitis* and *oral sepsis*. The effects of various forms of treatment were studied. Emetin had no appreciable influence on the course of the disease. Vaccine treatment alone, had no effect. "In conjunction with oral hygiene and dental treatment, it appeared to exert beneficial effect in 20 per cent. of advanced cases, the most conspicuous influence being the amelioration or cure of complications." "*Dental treatment*, in conjunction with regular *cleansing* of the mouth after meals, was the most effective form of treatment. By comparing results, it appears that the most beneficial treatment depends upon accuracy of judgment on the part of the *dentist* in determining the degree to which surgical procedure shall be carried out in a particular case."

New York Medical Journal, November 4, 1916.

- 16 **Malocclusion of the Teeth; Its Pathological Effect.** H. C. Ferris. Malocclusions of the teeth that express themselves pathologically, are divided by the author into three classes. First, those due to congenital or hereditary tendencies; second, those where the child is normally born, and where the developmental forces are interfered with after birth by infectious diseases, trauma, etc.; and third, those due to loss of function of the organ owing to environment, dietetic habits or mutilation of the arches by extraction. From the latter class may follow loss of function resulting in an under development of the bones of the head, producing mouth breathing and disturbances of the respiratory system, this in turn producing abnormal

development of the nasal bones and tissues, adenoids, polypi, etc. Digestion of carbohydrates is reduced in varying degrees. The nervous system is influenced by the lesions produced in the alimentary canal, in some cases resulting in epilepsy. There is also an increased susceptibility to dental caries and pyorrhea, and in mouth breathers to phthisis, pneumonia, diphtheria and tonsillitis.

New York Medical Journal, December 2, 1916.

- 17 Focal Mouth Infections: Their Systemic Effect and Treatment. R. H. Babcock.

The Pacific Dental Gazette, August, 1916.

18 The State Meetings.

Editorial.

Attention is called to the place given on the program of the California State Dental Association to focal infections and rational prosthesis. That the death of the pulp marks a tragic epoch in the patient's life, was the consensus of opinion expressed. Anything within reason should be adopted, rather than its devitalization. Any method of prosthesis implying destruction of the pulp or infliction of gingivitis or pericementitis is contra-indicated. Especial condemnation is visited upon the shell-gold and Richmond type of crowns. In the vast majority of cases calling for oral prosthesis, it is believed that such operations can be performed without jeopardizing the life of the pulp, while in those relatively few cases where this cannot be done, and where pulp devitalization is necessary, the writer is of the opinion that it would be better to allow the patient to continue through life with fewer teeth, than to run the risk of possible infection as a result of pulp devitalization.

The Texas Medical Journal, November, 1916.

- 19 Mastication. C. M. McCauley.
20 *The Treatment of Leucoplakia by Radium. R. H. Boggs.
21 Care of the Teeth. Editorial.

20 The Treatment of Leucoplakia.

Leucoplakia, a forerunner of epithelioma, is a disease of the tongue, gums and oral mucosa. It is characterized by whitish patches, often more or less thickened. Its course is chronic, and ulceration and malignant changes frequently occur. There are two types of leucoplakia, the true idiopathic and the syphilitic. The former is more often followed by malignant changes. It makes its appearance generally in men between the ages of forty and sixty, and should be treated as a potential epithelioma. Syphilitic leucoplakia is accompanied by induration, fissures and white fibrous tracts. Diagnosis may be confirmed by a Wassermann. All irritating treatment such as cauterants, gargles, etc., are contra-indicated. Radium has proven to be an efficient form of treatment. Even when it has become epitheliomatous, radium is the best form of treatment available, but guarded prognosis should be given if the disease is advanced.

The Texas Medical Journal, December, 1916.

- 22 Mouth Infections and Their Systemic Effect. A. H. Merritt.

NOTES ON DENTAL PRACTICE

COMPILED BY WILLIAM D. TRACY, D.D.S.

Effect of Grease on a Cement Mix.—Grease has no chemical effect on a silicate or zinc cement mix. Its influence is purely mechanical. Lack of homogeneity results, and if much grease is worked into the cement, cleavage lines will develop, with consequent loss in strength. Grease has no excuse for being anywhere near a slab or spatula when one is mixing. Applied externally to a filling, as in the case of cocoa butter, for preventing dehydration or access of saliva, grease has a proper place.—*Dental Quarterly*.

Symptoms in Ludwig's Angina.—If the disease is quite well advanced when you first see the patient, which it is likely to be (for they do not as a rule seek treatment until forced to) you will notice, as the patient comes in, that there is swelling on one or both sides of the face and neck, that the eyes are dull and the patient's whole attitude is that of one quite sick. The patient cannot open the mouth to any extent; in fact you can barely get your finger in to make an examination, and when you do you will find the floor of the mouth hard and board-like, with the swelling therein tending to force the tongue upward and backward into the pharynx. This makes breathing a little difficult and the patient has a tendency to hold the mouth open.—JNO. W. SEYBOLD, *Dental Digest*.

Diet in Relation to Dental Caries.—But what progress are we making toward a cure, toward a truly prophylactic treatment, toward the elimination of dental caries? The medical profession is working toward cures, toward immunity, and viewed in this light, our own profession has gone a bit lame in the march of progress. From the present tone of our dental literature, however, and from the investigations of our oral hygiene committees, it would seem that we are about to get a start in the right direction. And what is the right direction? From a process of elimination we can unhesitatingly say diet.—WM. R. POND, *Dental Cosmos*.

X-ray in Dental Infections.—A putrescent mass in the pulp chamber of a tooth may exist for months or years because the walls of the cavity cannot collapse and are incapable of throwing out granulations and eventually filling the cavity with healthy tissue, like the natural process of cure in an abscess in the soft tissues of the body. This putrescent mass may constantly poison the bony tissues surrounding the apical foramen sufficiently to produce an effect clearly recognizable in a radiograph. The condition may be unknown to the patient, and sometimes may not reveal itself to the usual tests applied by the dentist. From this long persisting source of infection, secondary lesions and symptoms of the gravest and most diversified character may arise. The X Ray is to be depended upon to show whether or not the source of

trouble is connected with the teeth or the pneumatic sinuses, and if so, whether the trouble is due to malposition and unnatural pressure or to infection. It would be a mistake to regard every case as due to the teeth and proceed to sacrifice the latter without first making a radiograph which may acquit them of any complicity in the matter.—SINCLAIR TOUSEY, *N. Y. Medical Journal*.

Mandibular Anesthesia.—We must admit that in some cases we have found it impossible to have pulps of molars removed under mandibular anesthesia. I remember one case distinctly. We gave three mandibular injections for the extirpation of the pulp of a first molar—pulpitis—but the slightest touch of the exposed pulp caused excruciating pain; at the removal of the tooth the patient experienced no pain whatever. It may be said that all symptoms of a successful mandibular anesthesia were present.—THEODOR BLUM, *Dental Cosmos*.

Prevalence of Foci of Infection around the Teeth.—In connection with a course of lectures given last January by Dr. Arthur D. Black for the University of California on "Diseases and Treatment of the Peridental Membrane," roentgenograms were made of the jaws of sixty-three consecutive persons, the large majority of whom gave no history of secondary effects, and every case showed an infection of some sort. That serious secondary manifestations are not more common as a result of these foci, is probably due to two factors; first, to the normal resistance of the individual's tissues, and second, to the fact that the bacteria of chronic processes are usually of relatively low virulence.—THOMAS L. GILMER, *Dental Cosmos*.

The Dental Toilet for Orthodontia Patients.—In my office, at an early sitting the dental hygienist gives patients a wash-bowl demonstration on the care of the mouth. It is well to see that they know how to move the liquid about the mouth with their cheeks in order to dislodge the larger pieces of debris first, to prevent packing them in tighter around the appliances or between the teeth or filling the bristles of the tooth brush. After brushing, a second rinsing will still remove some debris. In the half tumbler of water for rinsing I suggest using a teaspoonful of the acid-sweet mouth-wash, recommended by Pickerill. The formula for the one I prefer is:

Potass. tart. ac.	gr. 16
Ac. tartarici	gr. 8
Ol. limonis	m. 24
Saccharin	gr. 2
Aqua	ad oz. 8

It is claimed that this wash immediately excites a copious flow of saliva with a high alkalinity index which is maintained over a considerable period.—A. W. CROSBY, *Dental Cosmos*.

Proper Care of the Tooth-brush.—Alcohol and preparations having a fair percentage of alcohol in them, dissolved the sealing material from the backs of certain brushes where the bristles are fastened, and made

roughened places or grooves which are hard to keep clean. Boiling had a similar result. Carbolic acid, lysol, phenol sodique and potassium permanganate solutions either stained the brush or left an unpleasant odor, and were not altogether safe near children. The most satisfactory method with brushes of children seems to be to have them rinsed thoroughly each time under a strong stream of water, and daily washed out with Castile soap and water. The brush should always be shaken until it is dry as possible, and hung up in a place where there is good ventilation.—A. W. CROSBY, *Dental Cosmos*.

Influence of Mastication on Development of Respiratory Tract.—

Although there may be a vicious circle established in time, by which diseased organs in each of our special spheres cause an abnormal or deficient development in those of others, I am of the opinion that the primary fault lies in many instances rather in the neglect of the organs of mastication than in those of respiration. That is, instead of giving children food that requires chewing as early in life as possible, they are continued on an excessive and too prolonged milk diet, the more solid parts of their food being cooked to a semi-liquid or pasty consistency, thus depriving the upper respiratory tract of the blood supply which nature has evidently intended it should have, and which is absolutely necessary for its normal development.

If we could impress upon those who have to do with early physical education of infants, the influence of the function of mastication on the nose and throat and through the latter on the ears, we should save many people from having to go through life with the handicap of a more or less incurably diseased condition of the upper respiratory tract.—JOHN KEPKE, *Dental Cosmos*.

Symptoms of Vincent's Angina.—The subjective symptoms vary from slight sensitiveness to the touch to severe constitutional symptoms, with a temperature of 102° or higher, dysphagia, headache, malaise, nausea, marked salivation, loss of appetite, submaxillary and cervical adenitis. A characteristic feature in many cases is salivation at night, the pillow being stained with blood-streaked saliva. The breath is offensive, having a sweet, sickening odor of distinct diagnostic importance to one who has noted it in previous cases. The clinical diagnosis should always be confirmed by microscopical examination of smears.—H. S. VAUGHN, *Dental Cosmos*.

Suggestions for Prophylactic Procedure.—Regard the individual tooth as the unit; begin, for example, on the right upper third molar as the first round in the ladder, examine the gingivæ and all surfaces of each tooth in its turn; the gingivus for gum lesions and the crown portion for rough surfaces. Every surface except the occlusal should be smooth. Plane the roughness on the tooth crown surfaces, such as cavities, projecting margins of fillings, bands, enamel ridges due to faulty

development, improper use of tooth brush, etc. Restore all lost contact points where teeth are found out of line of the normal arch. Move them to proper positions. Orthodontia is only prophylaxis plus a marked degree of esthetics.—C. M. McCAULEY, *American Dentist*.

Condition Warranting Replantation.—In the present state of our knowledge, I believe that replantation is justifiable only in the following cases:

1st. When a tooth has been forced out of its socket by accident.

2nd. A tooth purposely removed in order to accomplish certain ends—as, for example, the extraction of a second molar in order to remove an otherwise inaccessible third molar.

3rd. When, as a last resort, a tooth must be extracted for the relief of pain or to correct an otherwise incurable condition.

Under any of these circumstances we are bound to use every means at our command to restore, if possible, the lost member to usefulness. These conditions occur with sufficient frequency in our practice to afford ample opportunities for experimentation, and we are not as yet justified in resorting to this operation for the correction of trifling disturbances.—M. J. CONGDON, *Dental Items of Interest*.

X-ray Observation of the Roots of Permanent Teeth.—Radiographic observation of the length and shapes of the roots of permanent teeth before orthodontic procedure will sometimes cause the orthodontist to modify his course of treatment. All teeth which are to be moved should be radiographed before the placing of appliances, on account of criticism which may come up if later the roots are found to be too short. Teeth with large well-formed crowns may have very short roots. In cases where the appliance is placed upon such teeth without radiographs, and later it is discovered that the roots are short, the natural tendency is to lay the blame upon the operator and the appliances. Sometimes radiographs reveal a tooth with the root end blunt, as though development had been arrested. Some made by the essayist are of cases which have been treated by the orthodontist; others, of cases where there has been no orthodontic interference. At the present time there is an orthodontist who is fearing a lawsuit because short roots have been discovered in a case where he neglected to have radiographs made before starting treatment. There is a field in orthodontia which, until recently, has been entirely overlooked; that is, radiographic observation of the behavior of roots of permanent teeth during orthodontic treatment. The essayist believes that much of value to orthodontia will be learned through this means, and in closing urges all orthodontists to use the X Ray freely.—A. H. KETCHAM, *Dental Items of Interest*.

Concerning Bridgework.—It may be laid down as a definite rule that in proportion as a mouth is disposed toward pyorrhea, just in that proportion it is necessary for the patient to have a piece of bridgework which can be readily removed and cleansed by him, and not only must it

be possible to remove and clean it, but the abutment remaining in the mouth must be so constructed that there shall be no projection beyond the line of what would be the natural contour of the tooth, to catch and hold food and other debris.—C. F. ASH, *Dental Items of Interest*.

Vaccines in Pyorrhea.—In pyorrhea we have a local chronic infection with the bacteria walled off by Nature to prevent a general infection. Little or no absorption of bacterial substances or products can take place under these conditions, preventing any immunizing bodies from being produced. If, however, bacterial vaccines are employed, these immunizing bodies are present in sufficient numbers to produce a cure, provided they are able to reach the infected area. If, by surgical means, this walled-off area is broken down so that blood can get in, carrying these immunizing bodies, the bacteria will quickly be destroyed. Furthermore, these bodies will continue to be produced for a long time after the infection has been cleared up, protecting the patient against a reinfection during the process of repair. Vaccine treatment is the only treatment that offers protection from reinfection during this process. This is an important factor in the treatment of pyorrhea.—G. B. HARRIS, *Dental Items of Interest*.

CURRENT NEWS

Items of professional news, of general interest, will be welcomed by Dr. C. F. MacDonald, Associate Editor, at 140 West Fifty-seventh Street, New York City.

DINNER TO DOCTOR CARR

The annual dinner of the First District Dental Society, S. N. Y., was given this year on Saturday, February 10th, in honor of Dr. William Carr, one of the foremost figures in the advancement of the dental profession during the last half century, and at present, Dean of the College of Dental and Oral Surgery in New York City. The N. Y. State Society united with the First District in the management of this important function. About one hundred and fifty, including some of the most prominent men in the state and country, gathered at the Hotel Astor and joined in endeavoring to show their appreciation of Dr. Carr's accomplishments and their affection for him as a man and friend.

Dr. W. B. Dunning, President of the First District Society, presided. He outlined the Society's purpose in holding an annual dinner, spoke of the desire of the Societies to honor one of their most distinguished members and finally, introduced the Toastmaster, Dr. Herbert L. Wheeler.

Many of those present would no doubt have been glad of an opportunity to express their feelings toward the guest of honor, but this privilege was granted to only a few. Dr. Wm. Jarvie responded to the toast, "State Board Reminiscences," in a beautiful way, he and Dr. Carr having been among the first to serve on this Board after its inception; Dr. E. T. Darby, himself one of the most loved men in the profession, spoke on "Progress in Dental Education," bringing out the great influence for advancement exercised by Dr. Carr over a long period of years; Mr. Wm. E. Purrington talked interestingly on "Thirty Years in Dental Legislation," and described the efforts of Dr. Carr toward professionalizing dentistry, making it respected and purging it of many men who were attempting to bring dishonor upon it; and Dr. B. Holly Smith answering to the toast, "The Personal Chapter," spoke of the character of the man, his ability, uprightness and perseverance in accomplishment.

At this point Dr. Dunning presented Dr. Carr with a handsome watch as the tribute of all those present and a token of their respect.

It is a regrettable fact, that often men who have worked faithfully and unselfishly for the good of their profession and mankind fail to be properly honored until they have passed on to their reward; therefore, it was peculiarly pleasant for Dr. Carr's many friends and admirers to have this opportunity of paying tribute to him while he was still with them and in good health. A large number of letters and telegrams of congratulation had been received from men all over the country, and as many as time allowed were read by Dr. Dunning.

The dinner was a great success. May good health and happiness be the lot of Dr. Carr for many years to come.

The City of New York is soon to see the opening of another school for instruction in Dentistry.

This new institution will be known as the New York Post-Graduate School of Dentistry and it has been established for the purpose of maintaining and conducting a school for advanced teaching of Dentistry. The preliminary announcement states:

The courses of instruction provided by the School have been planned to meet the needs of the general practitioner and will include practically all branches of dentistry.

The majority of the Courses will consist of didactic and clinical instruction and will include practical work in the School Infirmary and Laboratories.

The other courses will consist of lectures and clinical demonstrations, but will not include practical work.

Both "Intermittent" and "Continuous" Courses will be given, the intermittent courses being primarily for practitioners located in New York City and vicinity, and the continuous courses for practitioners located at a distance.

Following is a partial list of members of the teaching staff:

Henry W. Gillett, D.M.D.	Edwin W. Harlan, D.D.S.
Frank T. Van Woert, M.D.S.	George A. Thompson, D.D.S.
William D. Tracy, D.D.S.	John L. Courier, D.D.S.
William J. Gies, Ph.D., Sc.D.	Karl G. Knoche, D.D.S.
Theodor Blum, D.D.S., M.D.	Lewis K. Mobley, D.D.S.
R. H. Riethmuller, Ph.D., D.D.S.	John W. Scherer, D.D.S.
Paul R. Stillman, D.D.S.	Frederick W. Pratt, D.D.S.
James P. Ruyl, D.D.S.	William S. Prensky, D.D.S.
Louis J. Weinstein	Ervin S. Ulsaver, D.D.S.

* * *

Dr. Charles T. Warner of Boston who, for the past few years, has so ably filled the position of Editor for the Harvard Odontological Society is giving over this official position to Dr. Eugene Wyman of Cambridge. We regret to see him go from his official capacity but feel certain that, as always, we can still rely upon his loyal and untiring support of independent journalism. To Dr. Wyman is extended our most sincere welcome, as he takes over the editorship of this Society. We look forward to the happiest of coöperation and good will in future endeavor as they pertain to the interest and welfare of our JOURNAL.

* * *

The Bureau of Child Hygiene of the Department of Health of New

York, presents the following statistics relative to work done in the dental clinics for 1916:

Total cases registered.....	6,713	Normal	0
Cases discharged	5,167	Cured	4,902
		Dropped	265
Cases pending	1,546		
Extractions {	Deciduous	11,916	
	Permanent	2,718	
Fillings {	Temporary	2,541	
	Permanent	20,796	
Treatments	56,074		

* * *

The following "*specimen*" emanates from a well known Brooklyn M. D. who professes to be a specialist in roentgenology and who, under this guise, is accepting patients from dental practitioners and returning to them or to their patients, a diagnosis based upon his findings.

"X-Ray Findings:



"X-ray examination of the lower right jaw shows a zone of infection about the molar tooth. This begins at the margin, and completely surrounds both roots. The condition of the gum may be epulis, but it seems more like an infectious granuloma.

"Respectfully submitted,

"_____."

"Epulis—Tumor of the Gums. Gumboil Granuloma—A morbid infective growth whose tissues resembles granulations. A granulation tumor."

Taking advantage of the patient's lack of knowledge as to whether the above roentgenogram be good or bad is a vicious practice and can not be too earnestly condemned by all conscientious and honorable members of the dental and medical professions.

* * *

OUR ARMY AND NAVY

At this present moment every patriotic American should be vitally interested in the welfare of our Army and Navy and anxious to do everything which will tend to upbuild and make efficient all departments of our fighting forces. The Journal would like to call the attention of all members of the Allied Societies and others to the following, with a view to having formal action taken by the societies in the near future.

Recommendation of the Board of Trustees to the House of Delegates, National Dental Association:—

"Hereafter the Dental Corps of the Army shall consist of commissioned officers in the several grades as authorized for the Medical Corps, who shall have the same rank, pay and allowances as officers of corresponding grades of the Medical Corps, including the right to retirement as in the case of other officers, and there shall be for every seven officers of the Medical Corps authorized by law one officer of the Dental Corps. Dental officers shall be proportionately distributed among the several grades as in the Medical Corps, and their promotion shall be governed by the laws governing promotion in the Medical Corps; *Provided*, That examining and review boards shall consist of one medical and two dental officers. Immediately following the approval of this Act all dental surgeons then in active service shall be re-commissioned in the Dental Corps, in the grades herein authorized, in the order of their seniority, and without loss of relative rank in the Army."

Adopted by the Association of Military Dental Surgeons of the United States, June 1, 1916.

Adopted by the House of Delegates, July 27, 1916.

Indorsed by the San Francisco District Dental Society, June 12, 1916.

Indorsed by the California State Dental Association, July 15, 1916.

Indorsed by the Kentucky, Washington and Oregon State Societies.

Indorsed by Virginia State Society, October 6, 1916.

Indorsed by Southwestern Dental Society of Texas, Jan., 1917.

Indorsed by Connecticut State Society, Dec. 9, 1916.

This recommendation, if adopted by the authorities, makes for a proper recognition of the dentist in the Army. It should give the Dental Corps a standing which will offer more inducement to the better class of younger

practitioners to join and make this a life work. The Army needs in its service more earnest, capable and conscientious young men.

* * * * *

Item from Army and Navy Register, Feb. 3, 1917

Arrangements have been made by Dr. Franklin H. Martin, of Chicago, a member of the Commission of National Defense, looking towards the coöperation of medical schools throughout the country, in the matter of instruction of students with a view to their preparation to some extent for service in the Army and Navy medical departments. It is proposed that in this connection lectures on suitable subjects shall be delivered under the auspices of the heads of those corps and that there shall be established a form of instruction that will familiarize students in some degree with Naval and Military duties in connection with the work of their professions. By this means it is hoped to increase the interest of medical students in the service and so add to the list of those who may be eligible for appointment to the medical departments. It is hoped also to create an acquaintance with the military-naval function so that in time of war, physicians and surgeons who are desirous of volunteering, may come to the service of their country with some knowledge of those subjects in which medical officers are expected to be trained. It is understood that some 90 medical schools throughout the country with a total enrollment in graduating classes of more than 3,000 students, have signified their intention to participate in this work of preparation.

The above item contains much of interest and suggestion to the dental profession. Could not some such coöperation be effected in relation to the dental schools throughout the country? It certainly seems to offer an excellent and efficient means of assisting in our program for preparedness.

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NOTES FROM THE 1916 REPORT OF THE SURGEON-GENERAL OF THE NAVY

* **Rejections for enlistment from defective teeth..... 7,751**

SUMMARY OF DENTAL OPERATIONS PERFORMED DURING CALENDAR YEAR 1915

Character of Operations.	Number.
Abscesses treated	1,799
Bridges (made, repaired, removed and reset).....	198
Calculus removed	7,634
Crowns (made, repaired, removed and reset).....	503
Fractured Maxillae treated.....	27
Gums lanced	833
Necrossed maxillae treated.....	3
Pulp capped	317
Pulp devitalized	3,806
Pulp extirpated	5,820
Pyorrhea alveolaris (cases treated).....	1,776

Root canals filled.....	7,537
Teeth extracted	6,517
Teeth filled—	
Amalgam	18,699
Cement	9,665
Gold	35
Gutta-percha	5,495
Tin	1
Teeth regulated.....	112
Treatment other than specified above (cases).....	20,874
Total.....	91,651

NOTES FROM THE 1916 REPORT OF THE SURGEON-GENERAL OF THE ARMY

* Rejections for enlistment in the Army from Defective teeth.

	White		Philip-		
	Native Foreign		pine		
	Born.	Born.	Colored.	Scouts.	Total.
Defective teeth	83	12	4	9	108
Admission to sick report for diseases of teeth and gums.....					549
Other diseases of the mouth and adnexa.....					89

SUMMARY OF OPERATIONS FOR DENTAL AND ORAL DISEASES FOR ARMY

Dental Caries

Number of Cases Admitted Operations
Teeth Treated. to Treatment. Performed

United States (Continental), ex-			
clusive of Alaska).....	41,783	72,747	88,663
Philippine Department	10,703	17,777	18,539
Hawaiian Department	9,351	14,442	15,198
Canal Zone, Panama.....	3,669	6,516	7,603
China	764	1,244	739
Alaska	592	798	1,057
	66,862	113,524	131,854

* Note the difference between the number of rejections for defective teeth between the Navy and Army. The Navy requirements are very strict, while the Army requires only "four serviceable double (bicuspid or molar) teeth, two above and two below, so opposed as to serve the purpose of mastication."

CORRESPONDENCE

In re PROFESSIONAL JOURNALISM

Haverford, Pa., Feb. 10, 1917.

MY DEAR DR. DUNNING:

The article, "Independent Journalism *versus* Trade Journalism in Dentistry," by Dr. Gies, and your editorial in the December JOURNAL, carry me to but one conclusion; absolute approval!

In any disagreement with it, or in indifference to it, I see only danger to that higher endeavor that goes to make dentistry a learned profession. I cannot see how there can be an indifferent response to this call in a matter so vitally important to the betterment of the scientific standing of dentists as professional men; indeed, from every point of view.

To be progressive dentistry must stand for independent endeavor in the study of the scientific essentials of dental practice, and in the independent publication of its findings!

These purposes are from the first at variance with trade. Each should follow the methods embodied in the aims sought for. Trade should confine itself to commerce without injury to itself, its patrons or the ethical endeavor of the dental profession. This last embodies the ideal of scientific knowledge and its diffusion, and stands apart from the ideal of a trade journal.

The scientific ideals of practice call for research into the mysteries that underlie living principles, and the findings must be given unselfishly, for the relief of suffering, and the prolongation of life. This service is impersonal, disinterested, lacks all motive of material gain in professional endeavor. It is thus the antithesis of trade. Journalism having such aims should be independent of, and unhampered by trade influence.

The trade journal served its purpose at a time when it was needed, and in most instances served it well, but the advancement of business interests, hamper, are not consonant with scientific and professional aims, it is sometimes inimical to scientific essentials, and discards the ideals of scientific research.

Let the dental profession and the material supply houses, follow independently the inclinations of their interests as is the case with the general medical surgical supply houses. Each is honorable; let each to its kind in endeavor and service.

Discontinue associated meetings; let the profession pay its own bills, without obligation to trade. Let trade have its independent exhibitions confined to its own lines, for they are useful, instructive, helpful and interesting. Let dentistry hold its independent conventions, where absorbing subjects, vital to professional advance shall be presented and discussed without the disturbing influence of barter and sale.

Let me repeat that in the special field of dentistry there is, today, an

ideal at stake; and this ideal is the true spirit of knowledge, coupled with the disinterested and unselfish giving of that knowledge in a better service.

Sincerely yours,
H. C. REGISTER.

NEW YORK, Dec. 20, 1916.

DR. W. B. DUNNING, 140 W. 57th St., City.

DEAR DOCTOR: At a joint meeting of the Executive Committee and the Advisory Board of the School for Oral Hygiene, held at the office of Dr. W. D. Tracy, on Tuesday evening, Dec. 19, 1916, the following resolution was unanimously adopted:

"Resolved, That it is the sense of this Board that Dr. Louise C. Ball, as dean of the School of Oral Hygiene, has administered its office with signal ability, and that her efforts in its interests have our unqualified approval."

Very truly yours,

MATTHEW CARNEY,
Secretary.

BOOK REVIEWS

BY C. FRANKLIN MACDONALD, D.M.D.

ORAL ABSCESSSES, by Kurt H. Thoma, D.M.D., Lecturer on Oral Histology and Pathology and member of the Research Department of Harvard University Dental School; Instructor in Dental Anatomy, Harvard Medical School; Oral Surgeon to the Robert B. Brigham Hospital; Visiting Dental Surgeon to the Long Island Hospital; Consulting Oral Surgeon to the Boston Dispensary. 279 pages, with 287 illustrations, many colored; 6 lithographs. Cloth, price \$4.50 net.

Today ever increasing thought is being given to those grave pathological disturbances in the systems of patients which may be caused by local foci of infection in and about the oral cavity. Not only are the dental and medical professions awakening to these conditions but, to a considerable degree, the laity is rapidly coming to realize the necessity and value of proper diagnosis and treatment of these conditions.

Dr. Thoma, with his present book, has come before the profession at an opportune time. The busy practitioner has need of a treatise of general scope to instruct and inform him on this vital subject. The author, while presenting his own valuable and interesting personal work, has done what at this time seems most essential: namely, he has carefully analyzed, sorted and selected material from the valuable reports which have come out from time to time in different medical and dental publications. In this way he presents in a compact and concise manner, much that has been done during the past ten years and he has compiled all that is now generally accepted as fact and theory.

The opening chapters on the phenomena of infection and the history and classification of oral abscesses are a brief resumé of the essential facts of pathology and bacteriology, with reference to body cells, bacterial ferments, toxins, local and general infections, etc., etc.

The third chapter, discussing pathological development and diagnosis of alveolar abscesses caused by diseases of the dental pulp, enters into a detailed account of the various stages of abscess formation and their sequels. The etiology, course, termination and diagnosis of the various grades of abscesses are taken up at some length.

Two chapters are devoted to the pathological development and diagnosis of, first, alveolar abscesses due to other causes than disease of the dental pulp, such as diseases of the gums, impactions, etc.; secondly, abscesses of the tongue, salivary glands and ducts.

The section upon bacteriology of oral abscesses, takes up briefly the best means of collecting specimens and the approved methods of bacterial examination. Here also is presented a condensed review of the most important contributions pertaining to the bacteriological study of oral abscesses from 1893 to 1916.

From the standpoint of other pathological conditions which may be caused or materially aggravated by local foci of infection about the

teeth, the chapter devoted to secondary complications offers interesting and instructive reading. In a brief way are outlined the symptoms and pathological conditions found in various ophthalmic and aural disturbances, infectious diseases of the lymph system, blood and heart and diseases of the alimentary canal, nervous system and joints. Throughout this chapter are cited cases, many coming under the author's own observation and others selected from the reports of different writers, which point to the evident relation between these more or less remote diseased conditions and local pathological conditions in and about the teeth.

Examination of the oral cavity is divided into two parts, the first a short suggestion to the physician, recommending what he should particularly notice orally, in a patient for whom he is making a general examination. The second part is directed to the dentist and urges a more careful and better examination, utilizing all modern means, and especially the more accurate recording of these findings.

The chapter upon the treatment of oral abscesses is a valuable and interesting chapter. It presents the more advanced methods of dealing with these conditions, even though they may be considered by many as extreme. Ionic medication is suggested as a valuable adjunct "in cases of short standing . . . where the apex has not been affected by necrosis nor the periodontal membrane destroyed!" The author claims for it the sterilization of "the dentinal tubules as well as accessory foramina" and rather recommends the iodine ions as preferable to those of zinc or copper.

The procedures for apicoectomy, incorrectly designated apiectomy, are detailed not so much by text as by a very graphic and instructive series of three colored plates, presenting twelve steps of the operation.

"Prevention" is the title of a chapter that outlines the present views which all should hold towards appreciation of the dangers of infective foci within the mouth. Emphasis is laid upon the great care which every dentist should take, not only in eliminating such foci but in preventing their establishment, through lack of proper operative technic. More conservatism is urged in the extirpation of live pulps and the saving of exposed pulps, if the conditions give any hope of success.

The last short chapter, "The True Value of a Tooth," contains thoughts worthy of serious consideration and study.

The general appearance and composition of this book is to be noted as distinctly better than the author's first book, "Oral Anæsthesia." It is finely illustrated throughout, all the X-ray films that are reproduced especially showing clearly and fully just what they are intended to portray.

At just this time this book by Dr. Thoma should be read by all dental practitioners because it will, to say the least, give them food for thought. It will bring before them in a concise manner much valuable material upon one of the great problems which modern dentistry is struggling with. The book can also be recommended to the physicians because this question is of vital interest to them as well, and they should

know, not only what the dentist is striving to do and how he does it, but in many instances they should have a more accurate knowledge of the pathological conditions in the mouth, with their diagnosis and prognosis.

CROWN AND BRIDGE WORK, by Frederic A. Peeso, D.D.S., Director of the Dental Graduate School of the University of Pennsylvania. Octavo, 456 pages, with 752 engravings. Cloth, \$5.00 net. Lea & Febiger, publishers, Philadelphia and New York, 1916.

Dr. Frederic A. Peeso is well known to the whole dental profession for his ability as a teacher and worker in the field of crown and bridge work. Now Dr. Peeso has seen fit to present his mature judgments and the results of a long and successful practical experience in book form for the benefit of those unable to come under his personal supervision.

The last ten years have seen a veritable revolution in the specialty of crown and bridge work, following upon the findings of the serious, even fatal, pathological conditions which developed, unrealized, beneath many masterpieces of mechanical construction. The author strikes the vital point when he says in his preface, "the trouble justly complained of is not inherent in crown and bridge work construction itself—it is due entirely to errors of judgment in the selection or preparation of supports or abutments, and avoidable errors in designing and constructing the appliances." The introduction emphasizes the radical difference in the present-day methods and the "slipshod methods of the past," especially as regards the establishment of anatomical occlusion and in that a bridge "must be made aseptic from the foundations up."

The first three or four chapters enter into the proper treatment of root canals as the primary requisite for the construction of crowns or bridges. The so-called "heroic method" for the removal of vital pulps—the method of the past—is presented in detail, which seems in these days a waste of space and time. It would be much better to have devoted this section to a description of the modern method of conductive anesthesia, which has been *entirely* omitted.

The technic for root canal treatment and filling is possibly not so radical as many of the present-day root workers might like to see. The author's illustrations and suggestions for the handling of mesial roots in lower molars and upper bicuspid with two canals seems open to criticism. Who can tell, with the tooth in the mouth, whether conditions really are as hand-drawings of a possible ideal case have portrayed them.

The chapter upon typical shapes of teeth and mechanical preparation of the teeth and roots for the reception of bands, describes the instruments used and contains some very excellent photographs taken while at work in the human mouth.

As to impressions and models, it is definitely stated that "an impression for a working model, on which a crown or bridge is to be made, should always be taken in plaster," as should impressions to secure the relation of parts and bite.

In the handling of broken down roots, the author places no reliance upon amalgam restorations, but presents instead his method of banding such roots.

The chapters devoted to prosthesis and the making of crowns give in detail the various laboratory procedures, such as autogenous soldering, making of bands, construction of contoured gold crowns, Richmond, Downey and jacket crowns, with a discussion of the availability of the casting process in crown work.

The portion of the book considering bridge work is divided into fixed and removable bridge work. The fixed bridge is given considerable space, but later, as an introduction to the construction of removable bridges, the author states "it is very questionable whether there is a single instance where fixed bridge work answers the purpose better than removable." It is undoubtedly true that in almost every case where fixed bridge work has been placed, removable bridge work could have been used to a much better advantage and would have given far greater satisfaction to the patient." Under removable bridge work, the uses and construction of telescope crowns, tubes and split pins, and saddles are presented in great detail. For the paralleling of abutments, the Weinstein Paralleling Device is described.

Dr. Howard T. Stewart has written an interesting chapter upon bridge work designed for Riggs disease conditions. It is to be regretted that Dr. Stewart did not have more space available, that he might have entered into a more complete description of this important phase of bridge work. The construction and use of his attachments must require a mechanical skill of high order, and to the uninitiated it would seem that there were many pitfalls which a more detailed account of the methods employed might help to avoid.

Three other collaborators have written special chapters for Dr. Peeso. Dental Metallurgy, by Louis J. Weinstein, is a chapter of considerable interest. It contains much new and valuable information relative to investment compounds for soldering and casting, new formulæ for alloyed golds to be used for swaging or casting and presents an alloy composed of noble metals which can be satisfactorily used in place of iridio-platinum, it being much less expensive.

Drs. F. K. Ream and R. H. Reithmüller have united in writing a short chapter upon the uses and value of roentgenology in crown and bridge work. It contains a brief resumé of the use of the X-ray apparatus with suggestions and illustrations regarding the need for and uses of radiographs in crown and bridge work.

This book by Dr. Peeso presents, in a conservative way, modern teachings in the field of crown and bridge work. The author has omitted, however, to discuss certain procedures and ideas, which are in common use to-day, but this possibly can be explained by the fact that he has preferred to confine himself to those methods which he has tried and which have proved successful in his hands after considerable experi-

ence. The different processes are made most clear and great care has been taken to consider in a complete manner all the little technical points which arise in the constructions as outlined. The book contains sound principles and teachings, and by carefully following them as presented, one can hardly go astray.

ESSENTIALS OF OPERATIVE DENTISTRY, by W. Clyde Davis, B.S., M.D., D.D.S., Dean and Professor of Operative Dentistry and Technic, Lincoln Dental College, Associated with the University of Nebraska, Lincoln, Nebraska. 350 pages, 190 illustrations, mostly original. Second edition, completely rewritten, revised and enlarged. Price, silk cloth binding, \$4.00.

This book, by Dr. W. Clyde Davis, is just what its title suggests, a book primarily for the dental student, to be used as a guide in connection with lectures and presenting in a concise and understandable way, the principles upon which operative dentistry is based.

It is divided into three sections, the first part considering cavities in general; cavity nomenclature; methods of gaining access; production of resistance, retention and convenience forms; and finishing of enamel walls with toilet of cavity. Following the general considerations, cavity preparation is taken up in more detail. The last chapter discusses preparations for gold inlays. The following is noted relative to extension for prevention: "the abuses of extension for prevention result in much unnecessary loss of tooth substance, while its sane and legitimate use is one of the most important factors in tooth salvage."

The second section takes up the filling of teeth, giving the essential points for the manipulation of the various materials and something relative to their indicated uses. It may be noticed that the indirect method for making gold inlays is not referred to, and the space allotted to the somewhat obsolete method of swaging a gold matrix and then sweating contour, might be utilized to advantage for presenting this modern and precise procedure.

It hardly seems as though enough stress is laid upon the proper finishing of the occlusal surfaces of fillings, while the importance of reproducing proper cusps, sulci and inclined planes in gold inlays, and especially the careful carving and polishing of amalgam fillings might be dwelt upon to advantage. The student should begin early to realize that, not only must cavities be so filled as to prevent further decay, but masticatory function and efficiency must be preserved and restored as well.

The last section of the book presents those fields of operative dentistry not included by the preparation and filling of cavities. Here is considered means for the alleviation of dental pain, hypersensitive dentin and protection of vital pulps. Writing of "pulp preservers and so-called mummifiers," the following might well be specially noted: "Their use simply proclaims their users as unskilled laggards, who will accept an uncertainty to avoid a little honest labor in pulp extirpation and root filling. The entire procedure is diabolical and cannot be condemned in too severe terms as a retrogression in dentistry, unskilled in principle and unwarranted in practice."

Treatment of putrescent pulps, canals and the filling of roots are considered in a brief way. For putrescent canals the author strongly urges as a dressing, a paste composed of phenol and iodoform, claiming it to be most successful.

The extraction of teeth with local and regional anesthesia receives three chapters, but Dr. Davis takes up only the removal of normal whole teeth. Since the most difficult and considerable part of exodontia deals with the extraction of broken down teeth and roots, this section seems rather deficient. The suggestion to employ "a straight or bayonet-shaped forceps such as used in the extraction of superior incisors" for the removal of lower incisors seems to present an awkward and difficult method, especially in those cases, not so rare, where the lower incisors are tipped, rotated or have a distinct lingual inclination. It is hard to see the advantage of these forceps over those designed for easy removal of these particular teeth and roots. Stopping hemorrhage after extraction, by means of packing scrapings from oak tanned sole leather into the socket, seems a new suggestion and is recommended as "a method that has never failed in a long list of desperate cases."

This volume is for the dental student and should be considered of the greatest value in conjunction with an elaborate and efficient course of lectures. It may not prove of material use, however, to the practising dentist, as it does not contain enough of detail to recommend it as a book for reference.

ROENTGENOGRAPHIC DIAGNOSIS OF DENTAL INFLECTION IN SYSTEMIC DISEASES.
By Sinclair Tousey, A.M., M.D., Consulting Surgeon, St. Bartholomew's Clinic, New York. 72 pages and 70 illustrations. Price, \$1.50 net. Paul B. Hoeber, Publisher, New York, 1916.

Dr. Tousey is well known to members of the dental profession and in New York, by reason of many papers and writings upon the use of the X-ray in diagnosing dental lesions. The preface of the book states that this small volume "is an elaboration of articles on the same subject read before" various societies.

The author presents a case with roentgenogram and explanation as follows: "Young lady with a gold probe passing through the root canal and a fistulous tract in the upper jaw emerging in the nostrils" then—"it is interesting to note that the fistula healed without any operative treatment, either in consequence of the X-ray exposure or of the stimulation through the passage of the gold probe." It would be more interesting to have had another picture to show this condition cured, as the doctor describes.

Dr. Tousey adds to our already numerous causes for pyorrhea by the suggestion that root canal fillings extending through the ends of roots cause this disease! Branching into the field of operative dentistry, he suggests that offending substances may be removed . . . "through the root canal by enlarging the foramen"! Likewise, the rather dog-

matic assertion of cure of pyorrhea alveolaris by the "tried and proven X-ray and ultra-violet ray" is made.

However, getting back upon the subject of the relation of dental infection to possible systemic diseases, the author presents pictures of oral lesions which were credited with having caused or aggravated such pathological conditions as arthritis, endocarditis, tinnitus aurium, gastritis, etc., etc. These are interesting, but a fuller description of the cases from all standpoints would be most valuable.

We regret having to question the value of this book in its present state. It contains statements which are at variance with the present accepted theories of dental knowledge and on the whole, seems to present insufficient detail of those cases to describe which the book was supposedly written.

OBITUARY

MEMORIAL TO DOCTOR RUDOLPH H. HOFHEINZ

Resolutions passed by the First District Dental Society of the State of New York upon the death of Doctor Rudolph H. Hofheinz:

Resolved, That in the death of Doctor Rudolph H. Hofheinz, this Society has suffered the loss of a worthy confrère, who was highly esteemed as a foremost practitioner, a capable teacher and a gentleman of broad culture.

Resolved, That this Society expresses its grief and records its loss by spreading these resolutions upon its minutes; that they be published in the official Journal and that a copy be sent to his family.

GLADSTONE GOODE,
L. M. WAUGH,
Committee.

NOTICES

AMERICAN MEDICAL ASSOCIATION

CLINICAL CONGRESS, JUNE 4, 5

The American Medical Association will hold its annual meeting in New York City, June 4 to 8. In all probability this is to be the greatest meeting of medical men ever held in this country. The Committee on Arrangements consists of Drs. Wendell C. Phillips, Floyd M. Crandall and Alexander Lambert. Headquarters have been established at 17 West 34d Street, N. Y. City, to which all communications should be addressed. Monday and Tuesday, June 4th and 5th, will be devoted to a Clinical Congress, in which all departments of medicine will be represented, each department to have its own series of clinics, occurring in different parts of the city.

The following is a list of chairmen of departmental committees: General Medicine, Samuel W. Lambert; Pharmacology and Therapeutics, Frank S. Meara; Pathology and Physiology (A) Clinical and Medico-Legal, Otto H. Schultz; (B) Laboratory (Diagnostic) Frederic E. Sondern; (C) Cancer Research, Francis C. Wood; Preventive Medicine and Public Health, H. M. Biggs; (A) State, Linsly R. Williams; (B) Municipal, Haven Emerson; Pediatrics, Rowland G. Freeman; Dermatology, Howard Fox; Neurology, Edward D. Fisher; Mental Diseases, Carlos McDonald; General Surgery, Charles N. Dowd; Orthopedic Surgery, Virgil P. Gibney; Gynecology, George G. Ward, Jr.; Obstetrics, Edwin B. Cragin; Urology, Edward L. Keyes, Jr.; Rectum and Colon, Jerome M. Lynch; Ophthalmology, John E. Weeks; Otology, Edward B. Dench; Rhinology and Laryngology, Lewis A. Coffin; Stomatology, W. B. Dunning; Roentgenology, Lewis G. Cole; Anesthetics, James T. Gwathmey; Women Physicians, Mathilda K. Wallin; Brooklyn Representatives: John C. MacEvitt, William F. Campbell, Joshua M. Van Cott, Paul M. Pilcher, Albert M. Judd; Allied Topics: Trained Nursing and Training Schools, Miss Adelaide Nutting; District Nursing System, Miss Lillian D. Wald; Hospital Social Service, Mr. James K. Paulding; Planning and Financing of Municipal and Non-Municipal Hospitals, Sigismund S. Goldwater; Hospital Superintendents and Executives, Robert J. Wilson; Military Surgery and Red Cross, Samuel Lloyd.

The great number of clinics, their scope and scientific value, will be unprecedented. The program is in active preparation, soon to appear in full in the *JOURNAL* of the A.M.A.

Between seven and ten thousand physicians are expected to attend this Congress, and it is hoped that dental practitioners throughout the country will avail of this opportunity to become Associate Fellows of the Section on Stomatology and thus be entitled to attend these clinics as well as the regular meeting of the Association on June 6-8. *Only Mem-*

bers and Associate Fellows will be admitted. The following is quoted from a letter from the General Secretary:

Dentists holding the degree of D.D.S. who are members of state or local dental societies and who are not eligible to regular membership, may be elected to Associate Fellowship by the House of Delegates of the American Medical Association when a formal application for such Associate Fellowship has been approved by the Section on Stomatology. In other words, when a dentist holding the required degree makes formal application for Associate Fellowship, accompanying this application with a certificate from the secretary of his state or local dental society, which certificate certifies to his being a member in good standing in that body, this application and the attached certificate is forwarded to the secretary of the Section on Stomatology for the approval of that Section. The application is then in form for presentation to the House of Delegates for the election or rejection of the applicant.

We will be glad to transmit any such applications, or they may be sent direct to the secretary of the Section on Stomatology, Dr. Eugene S. Talbot, 31 North State St., Chicago.

Headquarters of the Section on Stomatology will be at the Hotel Astor, Broadway and 45th St.

No more impressive opportunity for the fraternization of dental and medical men has ever presented in the history of the profession. Every dentist who reads this announcement should enroll immediately in the Section on Stomatology (annual dues \$5, which entitles him to the weekly JOURNAL OF THE A.M.A.), and thus place himself in direct touch with the greatest happenings in medical science.

HENRY W. GILLET, T,

ARTHUR L. SWIFT,

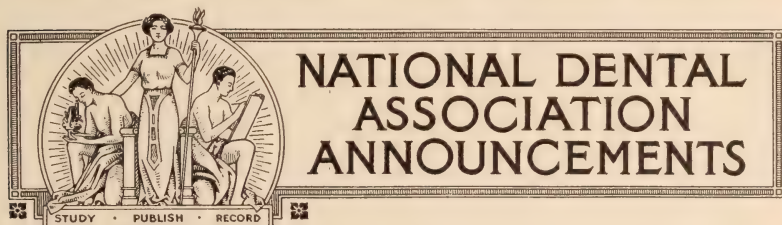
WILLIAM D. TRACY,

HENRY S. DUNNING,

ARTHUR H. MERRITT,

WILLIAM B. DUNNING, *Chairman,*

Clinical Com., Sec. on Stomatology, 140 West 57th St., N. Y. City.



The National Dental Association will meet in New York City October 22nd, 23rd, 24th, 25th and 26th. The Headquarters will be at the Hotel Astor, situated on Broadway, at 44th and 45th Streets. This hotel has the largest ballroom in the world, and this room will be used for all the General Assembly meetings. Other commodious ballrooms will accommodate the Sections, House of Delegates, etc., etc. The Exhibits will be shown in the beautiful Roof Gardens. Thus practically all of the meetings will occur under the roof of this spacious hotel.

Full accounts of the plans of what promises to be the largest and greatest meeting in the history of the Association will be published later. Suffice it for the present to state that the slogan for this year will be:

"QUALITY RATHER THAN QUANTITY"

Nevertheless, there will be quantity also. But the important announcement at this time must be the warning, "*Reserve your rooms at once. Make reservations by mail direct to the hotel of your choice.*" This may seem premature considering the abundance and variety of hotel accommodations listed below, but New York hotels are always crowded. Nearly seven hundred conventions met here during 1916. October is one of the busiest months. If you desire to get into any particular hotel therefore, it will be safest to write at once. For example, 150 rooms have been reserved at the Headquarters Hotel, The Astor, already.

The following is a list of hotels and rates:

HOTEL ASTOR, TIMES SQUARE, 1,000 ROOMS.

(General and Registration Headquarters.)

Single with bath.....	\$4.00	\$5.00	\$6.00
Double with bath.....	5.00	6.00	7.00
Two connecting rooms with bath (3 persons).....	9.00	10.00	11.00
Two connecting rooms with bath (4 persons).....	10.00	11.00	12.00

HOTEL M'ALPIN, BROADWAY AND 34TH STREET, 1,600 ROOMS.

Single without bath.....	\$2.50	\$3.00	
Single with bath.....	3.00	3.50	\$4.00
Double without bath.....	3.50	4.00	
Double with bath.....	4.00	4.50	5.00
Parlor, bedroom and bath (for 1 or 2).....	6.00	7.00	8.00

HOTEL WALDORF-ASTORIA, FIFTH AVENUE AND 34TH STREET, 1,300 ROOMS.

Single without bath.....		\$3.00	
Single with bath.....		4.00	
Double without bath.....		4.00	
Double with bath.....		6.00	
Parlor, bedroom and bath (for 1 or 2).....			14.00

HOTEL BILTMORE, MADISON AVENUE AND 43D STREET, 1,000 ROOMS.

Single with bath.....	\$4.00	\$5.00	
Double with bath.....	6.00	7.00	

HOTEL MANHATTAN, MADISON AVENUE AND 42ND STREET, 700 ROOMS.

Single without bath.....	\$2.50		
Single with bath.....	3.50		\$4.00
Double with bath.....	5.00		

HOTEL ALBEMARLE, BROADWAY AND 54TH STREET.

Single with bath.....		\$2.00	
Double with bath.....		3.00	
Parlor, bedroom and bath (2 persons).....			4.00

HOTEL ALGONQUIN, 59 WEST 44TH STREET, 250 ROOMS.

Single with bath.....	\$2.50		
Double with bath.....	3.50		
Double bedroom, sitting room and bath.....	5.00		\$6.00

HOTEL ANSONIA, BROADWAY AND 73D STREET, 1,600 ROOMS.

Single without bath.....		\$2.00	
Single with bath.....		2.50	
Double without bath.....		3.00	
Double with bath.....		5.00	
Two connecting rooms with bath.....		6.00	
Three connecting rooms with bath.....			10.00

HOTEL ARLINGTON, 18 WEST 25TH STREET, 175 ROOMS.

European Plan.

Single without bath.....		\$1.50	
Double without bath.....		2.50	
Single with bath.....		2.00	
Double with bath.....		3.00	
Parlor, bedroom and bath (1 person).....		3.00	
Parlor, bedroom and bath (2 persons).....			4.00

American Plan.

Single without bath.....		\$3.00	
Double without bath.....		5.50	
Single with bath.....		3.50	
Double with bath.....		6.00	
Parlor, bedroom and bath (1 person).....		4.50	
Parlor, bedroom and bath (2 persons).....			7.00

HOTEL BERKLEY, 170 WEST 74TH STREET, 300 ROOMS.

Single room with bath.....	\$3.00
Double room with bath	5.00

HOTEL BRISTOL, 122 WEST 49TH STREET, 180 ROOMS.

European Plan.

Single with running water.....	\$1.50
Double with running water.....	2.00
Single with bath.....	2.00
Double with bath.....	3.00
Two rooms with bath (2 persons).....	\$2.00 each
Two rooms with bath (3 persons).....	1.75 each
Two rooms with bath (4 persons).....	1.50 each

American Plan.

Single with running water.....	\$3.00
Double with running water.....	5.00
Single with bath.....	3.50
Double with bath.....	6.00
Two rooms with bath (2 persons).....	\$3.50 each
Two rooms with bath (3 persons).....	3.25 each
Two rooms with bath (4 persons).....	3.00 each

HOTEL BUCKINGHAM, FIFTH AVENUE AND 50TH STREET, 260 ROOMS.

Single without bath.....	\$1.50
Single with bath.....	2.50

Extra persons, \$1.00 each.

HOTEL CLARIDGE, BROADWAY AND 44TH STREET, 250 ROOMS.

Single with running water.....	\$2.50
Single with bath.....	3.00
Double with running water.....	3.50
Double with bath.....	4.00
Parlor, bedroom and bath.....	8.00

HOTEL COLLINGWOOD, 45 WEST 35TH STREET, 250 ROOMS.

Single without bath.....	\$1.50
Double without bath.....	2.00
Single with bath.....	2.50
Double with bath.....	3.00
Sitting room, bedroom and bath (for two).....	5.00
Sitting room, two bedrooms and bath (for three).....	7.50

HOTEL CUMBERLAND, BROADWAY AT 54TH STREET, 250 ROOMS.

Single with adjoining bath.....	\$1.50	\$2.00
Double with adjoining bath.....	2.50	3.00
Single with private bath.....	2.00	2.50
Double with private bath.....	3.00	3.50
Parlor, bedroom and bath (for one or two).....	4.00	5.00

HOTEL EARLE, 103 WAVERLY PLACE, 150 ROOMS.

	E. P.	A. P.
Single with bath.....	\$2.00	\$3.50
Double with bath.....	3.00	5.00
Parlor, bedroom and bath (for one).....	4.00	6.00
Parlor, bedroom and bath (for two).....	5.00	7.00

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Double with bath.....	4.00
Two rooms with bath (for four people).....	8.00
Parlor, bedroom and bath (for two people).....	5.00

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Double with bath.....	2.50	5.00

HOTEL IMPERIAL, BROADWAY AND 32D STREET, 800 ROOMS.

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Double with running water.....	2.00	5.00
Single with bath.....	1.50	3.00
Double, private bath.....	2.50	6.00

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	E. P.	A. P.
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Double without bath.....	2.00	5.00
Single with bath.....	2.00	3.50
Double with bath.....	3.00	6.50

HOTEL LEONORI, MADISON AVENUE AND 63D STREET, 225 ROOMS.

Single without bath.....	\$1.50	
Double with bath (for one or two persons).....	3.00	
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Parlor, two bedrooms and baths.....	8.00	10.00

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Double with private bath.....		4.00
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HOTEL MARGARET, 95 COLUMBIA HEIGHTS, BROOKLYN, 200 ROOMS.

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(For an additional person in room, 50 cents per day extra.)		

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Double with running water.....		4.00
Single with bath.....		3.00
Double with bath.....		5.00
Parlor, bedroom and bath.....		8.00

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Single with privilege of bath.....		\$2.00
Single with bath.....		2.50
Double with privilege of bath.....		3.00
Double with bath.....		3.50
Parlor, bedroom and bath (for one or two).....		6.00

HOTEL MURRAY HILL, PARK AVENUE AND 40TH STREET, 600 ROOMS.

Single without bath.....		\$2.00
Single with bath.....		3.00
Double without bath.....		3.00
Double with bath.....		4.00
Two connecting rooms with bath (for two).....		5.50
Two connecting rooms with bath (for three).....		6.50
Two connecting rooms with bath (for four).....		7.50

HOTEL PLAZA, FIFTH AVENUE AND 58TH STREET, 750 ROOMS.

Single with bath.....		\$3.50
Double with bath.....		4.00
Two connecting rooms with bath (for three).....		7.00
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HOTEL PRINCE GEORGE, FIFTH AVENUE AND 28TH STREET, 750 ROOMS.

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Double with bath.....		4.00
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Single with bath.....	\$5.00	
Double with bath.....	7.00	\$10.00

HOTEL ST. MARGARET, 129 WEST 47TH STREET, 130 ROOMS.

Single with running water.....		\$1.00
Single with bath.....		1.50
Two rooms and bath.....		3.50

HOTEL ST. PAUL, SIXTIETH STREET AND COLUMBUS AVENUE.

Single without bath.....		\$1.00
Single with bath.....		2.00
(For each additional person in room, \$1.00 extra.)		

HOTEL SEVILLE, MADISON AVENUE AND 29TH STREET, 475 ROOMS.

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Double without bath.....	2.50
Single with bath.....	2.50
Double with bath.....	3.00

HOTEL SOMERSET, 150 WEST 47TH STREET, 225 ROOMS.

Single	\$2.00
Double	3.00
Parlor, bedroom and bath.....	4.00

HOTEL VANDERBILT, 34TH STREET AND PARK AVENUE, 600 ROOMS.

Single with bath.....	\$3.00
Double with bath.....	5.00

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Single with bath.....	\$1.50	\$3.00
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Single with bath.....	2.50
Double without bath.....	3.00
Double with bath.....	3.50
Two double with bath.....	8.00
Two single with bath.....	5.00
Double and single (for three).....	5.50
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* * *

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The Fifty-Third Annual Meeting of the Massachusetts State Dental Society will be held on May 3, 4 and 5, 1917, at Springfield, Mass.

J. ARTHUR FURBISH, D.M.D.,
Secretary.

* * *

MASSACHUSETTS BOARD OF DENTAL EXAMINERS

A meeting of the Massachusetts Board of Dental Examiners for the examination of candidates, will be held in Boston, Mass., March 20 to 23, inclusive. For further information address George H. Payne, secretary, 29 Commonwealth Avenue, Boston, Mass.

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THE JOURNAL

OF THE

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VOL. XII

JUNE, 1917

No. 2

PROFESSIONAL JOURNALISM AND THE DENTAL PROFESSION IN AMERICA

By THADDEUS P. HYATT, D.D.S.

PROFESSOR GIES has written an article entitled "Independent Journalism *versus* Trade Journalism in Dentistry," which was published in the December number of this magazine. Professor Gies's article is interesting, but unfortunately constructed, for the reason that while a great many of the ideas expressed are idealistic and worthy of every effort of professional men to attain, there are other portions of the article which certainly are insults to the dental profession of America. It is to be regretted that the author of this article did not confine himself to a policy of constructive effort in an educational campaign, to arouse the members of our profession to the need of, and support in, a larger field of usefulness; one in which we have not entered to any very great extent, namely, professional dental journalism to be maintained, controlled and supported by members of our profession.

The title of Professor Gies's article I consider unfortunate. I cannot accept the statement that there exists a condition of antagonism between the so-called dental trade journals as referred to by Dr. Gies, and any efforts on the part of our profession to produce, support and publish journals of our own. It will be interesting if Professor Gies can produce some facts as evidence of this antagonism.

In reading the first portion of the article and the splendid definition of what professionalism means, a feeling of delight and enthusiasm is aroused, and one desires to endeavor to uphold and maintain these high ideals, but as one reads the article further and sees that the Professor is the first to fall away and lose sight of these ideals, and descend to sarcasm, slang and insinuations against the character and integrity of some of the best men in our profession, we deeply regret that he has so wasted his splendid ability in writing in this manner. All will agree, I believe, that the real reason why there are not more journals owned, supported and published by dentists, is a lack of appreciation by many of us of the great advantage that would come to our profession by undertaking this arduous, though very gratifying work. We must realize, however, that it is only within the past few years that dentists have given more serious consideration and study to their science, and to-day men are taking post-graduate courses in study classes, organized and managed by dental societies throughout the country in almost every branch of modern and advanced dentistry. This was not the rule but a few years ago.

Think of the great change that has taken place in the recognition of our obligation to give financial support to our professional organizations. I can remember attending a convention of the New York State Dental Society but a few years ago, and learning to my chagrin and dismay that the State Society was indebted to one man to the extent of over \$3,000, and had been under this indebtedness for a number of years. When I suggested to several of the more prominent men that an assessment should be made, or that the dues, which I think were \$2.00 per year, should be increased to a sufficient size to pay off this indebtedness, my idea was greeted with horror. I was informed that the dues should be only \$1.00, for then we could secure more members, but if we should make the dues \$3.00 a year, half the men would withdraw from the organization. To-day the dues in many of the local district societies run from \$6.00 to \$10.00 per annum, and the membership has not fallen off, but, on the other hand, is increasing.

Dr. Gies has considered himself free to make certain defini-

tions in regard to what a trade journal is, or what a professional journal is. I do not consider them sufficiently clear to enable us to differentiate between the trade journals of medicine in the days gone by and the so-called trade journals in dentistry of the present time; nor is the definition in regard to professional journals sufficiently clear to convey to dentists a proper conception of his meaning. I, therefore, offer the following definitions: A journal, devoted to the sale of goods which are advertised not only in the form of advertisements, but also in the form of reading matter, either in editorials or as original articles, is a trade journal. A journal, the reading matter of which is devoted to scientific subjects, and its editorials to professional matters, and to the interests of its profession, and which journal does not, and will not, accept articles devoted to the exploitation of some trade goods, is, I maintain, a professional journal in the broadest and most liberal sense, absolutely regardless as to who pays the printer's bills and whether there is a loss or profit in the financial management. As a professional journal is not published for the purpose of gaining money, its reasons for accepting advertisements from trade houses should be clearly set forth upon the page preceding that portion devoted to advertisements. It makes little or no difference if the publishers, whether a body of professional men, a publishing house, or a manufacturer of dental goods, derive any money profits over and above cost of production. This financial success is immaterial from the fact that professional men should not enter the field of dental journalism for the purpose of making financial profits.

If publishers receive a profit from the sale of scientific and medical books, no one questions their honesty or sincerity, likewise no one questions the ethical and professional standing of the authors of these books. Also, if the publishers of a dental journal, regardless of who they are, derive financial profits from its publication, this does not, and cannot affect its standing so long as the journal maintains the standard I have defined as constituting a PROFESSIONAL JOURNAL, nor can the ethical and professional standing of its editor be questioned. Professor Gies in his article says these remarks are addressed against a

"system, not an individual." It is to be regretted that the Professor did not keep to this resolution. Remarks directed against a system do not necessitate the selection of one particular journal. In this article Professor Gies speaks of the *Dental Cosmos*. Surely this single dental journal is not "a system."

The list of questions propounded by Professor Gies is not only large, but each question contains so many parts that they are almost confusing. For instance, the first question contains some five or six sub-questions.

QUESTION No. 1. Why is it that the trade journal in medicine (almost an extinct species) is without influence, standing or repute among medical men? Is it because doctors of medicine have more professional self-respect than doctors of dentistry; or because medical men regard medicine as a profession and not a trade; or because physicians have learned that, as a rule, medical men cannot serve the financial interests of proprietors of patent medicines, or of traders in medical apparatus and instruments, etc., without betraying the medical profession, and defrauding the public, in behalf of the selfishness such medical renegades would thus represent on a trade basis?

ANSWER: I will take the first sentence: "Why is it that the trade journals in medicine (almost an extinct species) are without influence, standing, or repute among medical men?" This is rather easy to answer: Because there used to be medical trade journals (now almost an extinct species), which were published for the purpose of selling goods which were advertised in the form of reading matter or scientific articles and were therefore misleading and unreliable. I am in receipt to-day of quite a number of little bulletins, pamphlets and booklets from medical houses, advocating the desirability and benefits of certain drugs, surgical instruments, etc., but I am frank to say that I have never considered them journals or professional medical journals at any time.

The second part of this question: "Is it because doctors of medicine have more professional self-respect than doctors of dentistry?" This is one of the parts of Dr. Gies's article that I regret with great sincerity. It is this slur, this insinuation in regard to the character and the standing of the men of my profession, that I resent and repudiate as being untrue in every way. That Professor Gies should have been elected an honorary

member of one of the dental societies of the State of New York, that he should have been associated with many of the leading men of the dental profession, makes it almost inconceivable to me that Professor Gies could cast such a slur in the face of those who have the highest esteem and admiration for his work and his coöperation. It will little avail Professor Gies to make any attempt to refute or repudiate the printed statements that are contained in his article. It is owing to these remarks that so much antagonism and criticism has been directed against the journal that has permitted their publication. It is amazing that the editorial staff which consists of some of the best friends that I possess—men who have my warmest heart feelings and admiration, should have, through an oversight on their part, allowed to appear in the pages of a professional dental journal this attack upon our profession.

Dr. Gies asks: "Is it because doctors of medicine have more professional self-respect than doctors of dentistry?" This question is rude. It is the same kind of a question that might be asked of a gentleman: "You are not a blackguard, are you?" Then when a look of anger comes into the eyes, and the questioner notices the hands are closing fast, he quickly answers: "Of course, not, I did not intend to imply you were." Then, in the name of common sense, why ask such a fool question?

Let us read carefully and examine analytically the next part of this same sentence: "*Or because medical men regard medicine as a profession and not a trade?*" The implication is plain, and is an insult to the profession that has honored Professor Gies, and it is an insult to each individual member of the First District Dental Society who elected Professor Gies an honorary member of their Society; I hope they will resent it. We are asked if dentists do not regard dentistry as a trade and not as a profession. Probably the questioner may exclaim in some subsequent article that no harm is meant, that he is only attacking a system and not a profession, but we cannot be satisfied with any such reply. The only satisfaction that Professor Gies can give me is a withdrawal of those questions, and I believe that I voice the sentiment of all true men, when I make this state-

ment. This is why I have stated I consider the article unfortunately constructed. The balance of this question is merely a repetition in substance of the first part, and could easily have been omitted.

QUESTION No. 2. Why is it that trade journals have no standing or influence among scientific investigators—men who, as a rule, are particularly representative of the ideal of unselfishness in public service? Why is it that the journals representing the sciences have been, and continue to be, completely independent, and professional in character and conduct?

ANSWER: Because these trade journals (now almost an extinct species) were published for the purpose of selling goods which were advertised in the form of reading matter or scientific articles, and were therefore misleading and unreliable.

QUESTION No. 3. It is frequently said that trade journals in dentistry can be, and usually are, conducted with *large* financial profit to the owners. Why is it that trade journals in dentistry are usually very successful, financially, whereas independent dental journals are often conducted at a financial loss to those who establish and manage them?

ANSWER: It would first be necessary to have this question given in a more definite form. If Professor Gies refers to such journals as the *Dental Cosmos* and *Dental Items of Interest* he should first prove to the satisfaction of impartial critics that these journals are of the same kind and make as were the now almost extinct species of medical trade journals he refers to. *A journal, the reading matter of which is devoted entirely to scientific subjects, and its editorials devoted to professional matters, and to matters of interest to its profession, and which journal will not, has not, and does not accept articles devoted to the exploitation of some trade goods; such a journal is, I maintain, a professional journal in the broadest, and most liberal sense, absolutely regardless as to who pays the printer's bills and whether there is a loss or profit in the financial management.* With this definition of what a professional journal is, and with the knowledge that so many of my confreres possess, I will challenge Dr. Gies to prove that either the *Dental Cosmos* or the *Dental Items of Interest* is not a professional journal.

Professor Gies seems to be very much worried in regard to financial profits or losses. To my mind, if any professional journal is conducted at a loss, it shows poor management. As a professional journal is not published for the purpose of being a financial success, it follows that the expenses of publications must be properly arranged for. These expenses must be met by voluntary contributions, either by a subscription price of sufficient size, or by a fund raised and maintained by professional men so that the subscription price may be low enough to enable poorer members of our profession to subscribe and be able to gain the advantages of the scientific information that it would contain. But, after all is said and done, to bring in the financial aspect, or workings of a journal, as having any bearing upon the desirability, or undesirability of a profession to have, and possess, and to publish a professional journal, is absolutely wide of the mark, and I for one, fail to see why the Professor has given so much time, space and consideration to this unimportant question as having any bearing on the distinction between a trade journal and a professional journal.

QUESTION No. 4. Can any one name a dental journal now under trade control and, today, under competent and laudable editorial conduct, that would not become permanently more efficient and professionally more acceptable, if the salaries of its editors and managers were paid from, say, an endowment fund provided, directly or indirectly, by the dental profession; and if its editors and managers were expected to serve, and were wholly *free* to express, their highest individual and collective conceptions of professional function, opportunity and duty, in *all* departments of the journal, *including that devoted to advertisements*, if any were admitted?

In answer to Question No. 4, which is another one of those compound multiple questions, I would answer first: "Yes," and then would name the *Dental Cosmos* and *Dental Items of Interest*. Not by the wildest stretch of imagination can I conceive of journals conducted along more ethical or professional lines, nor do I believe it would make one particle of difference in the management of these journals, were the editors to receive their entire salaries from members of our profession, or to publish their journals under the auspices of the National Dental Association,

QUESTION No. 5. To what degree are editors of trade journals in dentistry paid by the owners for their editorial work, and to what degree for their professional standing and influence as trade assets? Is it probable that the greater the influence of the editor among his colleagues, the smaller his editorial salary? Do supply-houses do business on such a basis?

I will answer this question by asking questions. Does a publishing house accept the manuscript on a medical, dental or scientific subject from an unknown, unscientific and illogical writer, and then spend money to print, publish and advertise such a book? Does a medical, dental or scientific society invite a man to read a paper before it because of his ability, or because he is popular and a jolly good fellow with money to burn, who they know will stand treat for all the boys? Do medical, dental or scientific societies conduct their meetings on such a basis? The answers to my questions will answer Professor Gies's questions.

QUESTION No. 6. If it is conceded that trade interests and professional purposes often conflict, how can dentists believe that, in accepting employment or fees in behalf of trade projects in dentistry, their status as professional men is unimpaired?

ANSWER: It cannot be conceded that trade interests and professional purposes ever conflict. I am not interested in some single trade good that may need to be sacrificed for the good of the profession. This question was not intended, I take it, to apply to such cases, but rather to apply to the broad principle of trade interest and professional purposes. The answer, therefore, is so simple that I am at a loss to understand why Professor Gies thought it necessary to ask. The best interest and the permanent interest of the trade, which is associated with a profession, is bound up in, and progresses with the advancement and progress of that profession. This should be self-evident to all, and particularly to the trade houses. Any article, not beneficial and helpful to the profession is doomed to be discarded sooner or later, and the trade house which tries to force it upon the profession by the expenditure of money in advertising, is unbusinesslike and foolish, and is working against its own interest.

QUESTION No. 7. If I were to permit John Smith to exploit a dentifrice of variable composition, and of doubtful prophylactic value, bearing my name as professional sponsor and factotum in his business, would I (presumed to "know a thing or two") be giving the use of my name and professional position primarily in support of the statements on the label and for the "advancement of the profession," or primarily in behalf of his trade and my pocket? What is the difference between dentifrices and trade journals in this respect?

ANSWER: If Professor Gies were to permit John Smith to exploit a dentifrice of no prophylactic value and known to be harmful to the teeth and adjacent tissues, he should be prosecuted by the legal authorities.

QUESTION No. 8. Why should a journal that is conducted *in the name of a profession*, and presumably in *behalf* of that profession, be managed for *private* profit? Can it be done without exploitation of the profession that journal is assumed to represent? Would it not be quite as appropriate to conduct the churches on that basis—"they would be so much better managed, you know, and less expensive besides"? Would it not be to the interest of a profession if profits from its journalism were put into its journals instead of into trade pockets? If trade journals in dentistry are 'conducted in the interest of the profession,' why do the owners of such journals, and the high-minded dentists in their editorial employ, *keep the profits for themselves and resist the progress of independent journalism?*

ANSWER: There is no more reason why the publishers of a journal should not receive some benefits from their labor, than to expect publishers of medical, dental or scientific books to give up the profits they may receive. It would be perfectly proper for the American Medical Association to derive a profit from the publication of "Archives of Internal Medicine." It would be its privilege and its right to devote these profits to scientific investigation, to the enlargement of its magazine, or to pay a salary to its editor, or editors, as those in authority might deem wise and just. What is fair and just for the publishers of "Archives of Internal Medicine," must also be fair and just for the publishers of other journals. I wonder why Professor Gies brings in churches. Is it because Professor Gies goes to church so seldom that he does not know what churches stand for? The profession of medicine or dentistry is a progressive science. The knowledge of the

past but serves as a basis for the gaining of future information, and therefore, it is constantly changing and improving. The churches, in the broad sense, are quite different. Their teachings are dogmas, based upon faith. All of their knowledge, religion or science, is already established. Our better understanding of it comes from a deeper study of that which is, and which has been established these many years past. "Would it not be to the interest of a profession if profits from its journalism were put into its journals instead of into trade pockets?" Of course, everybody admits this. I will even go further. It would be to the interest of the profession if all the profits of the whole trade business were to be taken over by the profession and managed by them in the interest of their profession. This would also include all professional books.

Professor Gies seems to balk at "devoted to the interests of the profession." I have always understood this to mean that the articles were upon dental subjects and none were or would be published which related to methods of cooking griddle cakes, or the washing and dressing of babies, unless later it should be discovered and proven that these subjects were scientifically related to dentition.

"Why do the owners of such journals, and the high-minded dentist in their editorial employ, *keep the profits for themselves, and resist the progress of independent journalism?*" To put it very mildly, this is another of those unfortunate remarks that I consider unjust, uncalled for, and is directed against two of the most valuable and prominent members of our profession, not only in this country, but throughout the world. I ask all fair-minded members of my profession carefully to consider this question: In what way have editors of dental journals such as *The Cosmos* or *Dental Items of Interest* resisted the progress of independent journalism? In all fairness to members of my profession, and in obedience to all *generous* and *altruistic* rules of an ethical profession, Professor Gies should first have established and proved his charge that both Dr. Kirk and Dr. Ottolengui have resisted the progress of independent journalism, before he published such a statement, and one which, I believe, to be absolutely false. If the men of my

profession agree with me, I ask them to be brave enough to write and frankly state their feelings on this point. I want it understood, I am heartily in favor of our owning, supporting and publishing our own journals. I will join with other men to do this, and will pledge myself to contribute \$100 a year for ten years so we *may* start, establish and publish such a journal. This desirable condition can be obtained without insulting or attacking the honesty, integrity and professional standing of those whose lives, and every effort have been devoted to helping you, and helping me, to become more efficient in our skill, and more thorough in our knowledge, and who have enthused many of us to become more devoted to the profession we love and serve.

The question whether an editor should be responsible for the advertisements appearing in his magazine is an open one. I think it is very desirable to exercise great care in the selection of what advertisements shall be admitted. But to hold the editor responsible for every advertisement, with which I do not agree, or think good, is more than I think just or fair.

Does Professor Gies believe that the editors of all professional journals stand back of and guarantee every statement made in the advertisements in their journal? I do not believe it, nor do I think it would be fair to expect it. It is sufficient if, in the reading matter, I am educated so as to be able to use my own judgment in the selection or rejection of trade articles, and, up to the present, I have never bought an article because it was advertised in this or that magazine. The fact that the article was advertised in *THE JOURNAL OF THE ALLIED DENTAL SOCIETIES* has had absolutely no weight with me, as I do not believe these Societies have investigated these articles, or that the editorial staff has given them any specially low rate for the benefit of their subscribers or the members of their Societies. If the trade house could not afford to pay the regular price for advertising in this journal, the information was rejected, no matter what the value or the nature of the article the trade house wished to advertise.

It seems to me unnecessary to answer all of Professor Gies's questions, as it would not only take up a large amount

of space, but also because those who have read Professor Gies's article, and are now reading mine, will know how I should answer them. Also, I do not think it is necessary to answer any more of these questions for the reason they are so irrelevant to the main question, viz., the desirability of our profession owning, controlling, and publishing more journals devoted to the science of dentistry.

Professor Gies cordially extends invitations right and left to editors, of so-called trade journals, to members of the dental profession, and to everybody else who may be interested in the subject. I am sorry, however, that in the extension of this invitation, Professor Gies was not more tactful and polite. Knowing as I do, that the editors of *Dental Items of Interest* and *Dental Cosmos* do not consider themselves editors of trade journals as defined by Professor Gies, they could not accept such an invitation, without first tacitly admitting that Professor Gies was justified in the definition he wished to impose upon them. I have therefore felt it incumbent upon me, as a warm personal friend of one, and as a great admirer of the integrity, honesty and professional standing of both, to endeavor to answer Professor Gies's article to the best of my ability. It is a great pity that Professor Gies should have said anything that might seem to belittle either Dr. Kirk, editor of the *Dental Cosmos*, or Dr. Ottolengui, editor of *Dental Items of Interest*, by the promulgation of questions which are insults to professional men, and insults to honest, dignified gentlemen, and when I say gentlemen, I mean it in the highest sense it is understood and meant.

One of the most remarkable parts of Professor Gies's article, is that, which is contained on page 593. On this page is printed the emblem of medicine—an emblem that is used upon many medical books, upon the uniforms of medical officers of the United States Army and Navy, and, I believe, on the medical uniforms of almost every army and navy of the world. It is plainly evident, to anyone, that Professor Gies has no conception, comprehension, understanding, or knowledge of the meaning and significance of this emblem. He speaks of it in a paragraph devoted to sarcasm. It does not need any further comment on my part. I would simply ask those who are not familiar

with the symbolism of this emblem to read about it in the *Encyclopaedia Britannica*, and then to read once more the paragraph devoted by Dr. Gies to a criticism of this emblem.

Allow me to say that I have the greatest admiration and respect for the earnestness and sincerity of Dr. Gies in the maintenance of professional integrity and standing. I admire him in the arduous work he has undertaken in coöperation with our profession, in studying those problems that need solution, and which solutions when achieved, will be of such untold benefit to mankind. I do not feel that it was necessary for Dr. Gies to have introduced into the article testimonials in regard to his own standing and his own position in his profession. I do not feel that it was necessary for the members of the Dental Society who elected him an honorary member of their organization for them to have been informed that even President Butler, of Columbia University, considers Professor Gies a professional man. I had taken that for granted.

I cannot refrain from referring to an amendment that was adopted by the Society for Experimental Biology and Medicine. To me it is rather amusing that an organization should adopt such an amendment, worded as this is worded, and I may presume that it has been correctly printed in THE JOURNAL OF THE ALLIED DENTAL SOCIETIES on page 608 of the December number, 1916. Allow me to quote: "*Any member of this Society who may consent to the use of his name in any way that would aid in increasing the sale of any patent medicine, proprietary food preparation, or any similar product for which, in the opinion of the Council, inaccurate or misleading claims are made, shall forfeit his membership.*" One is to infer from this amendment that if the patent medicines or proprietary food preparations are bona fide and good, any member of the Society for Experimental Biology and Medicine, may, for a consideration, which, of course, should be a financial one, as this article is devoted very largely to the question of finances, allow the use of his name that would in any way aid in increasing the sale of such patent medicine or proprietary food preparation. I am surprised that this evidence of the professional standing of the members of the Society for Experimental Biology and

Medicine should have been advanced by Professor Gies, as I do not see in what way these amendments are related to the question of the desirability of the dental profession owning and publishing journals devoted to the interest of their profession.

I again repeat that I regret with sincerity and with sadness that the great ability of Dr. Gies has not been devoted *exclusively* in this article to an appeal, and an argument depicting the advantages and the benefits that would come to the dental profession by its members devoting more time and more interest to the journalistic field in dental science.

Very different is the editorial in the same number of the magazine. With almost all of it we can agree. The spirit of it rings true. Though there may be a difference of opinion in regard to some minor part, yet with the whole article all men are in accord. The editor remarks that the article by Professor Gies will shock the sensibilities of some of its readers because they dread any radical change of viewpoint regarding matters lying at the foundation of our profession. The only reason that the article by Professor Gies had produced any shock, has been because many parts of his article have violated all the rules of justice and fair play. Had these parts been cut out, the article would have been worthy of its author and the magazine that published it.

"The "mingling of interests" between the medical profession and medical trade houses, and the dental profession and dental trade houses, still exists in regard to State and National conventions. How is it that both these professions depend so largely, if not entirely, for the financial support of trade houses to make their conventions, not only successful, but even possible? Not that I object to these trade exhibitions, for they have been of great aid and use to me, but why denounce trade support in one direction and smilingly seek and accept it in another?

We should be just to all.

We should have the courage to place the blame where it properly belongs.

With the alteration of one word, I wish to conclude these comments by quoting in full one paragraph from the editorial

in the December number of this magazine, and which not only expresses my sentiments, but also expresses the truth in regard to this whole subject.

"Just here, however, it is only fair to confess that 'all' of the fault lies on our side. How many dentists, taken by and large, give any serious thought to this matter? How many care what the activities of the commercial concerns may be? How many dentists at this date would make any serious sacrifice to establish and safeguard an untrammelled professional journalism? Our reforms must begin at home. We cannot expect the trade houses to abandon this highly profitable 'mingling of interests' while we remain not only indifferent, but willing by voice and act to coöperate with them. If, as practitioners of a specialty in medicine, we hope to fill responsibly our place in a great and learned profession, we must adjust our lives to the spirit of that high calling, and by unmistakable action, banish even the suspicion of divided motives."

COÖPERATION OF DENTIST AND ORTHODONTIST¹

By J. LOWE YOUNG, D.D.S., New York City

THE profession of dentistry, while new in comparison with that of medicine, has now reached the stage in its evolution, where, for the best interests of the laity, division of labors and responsibilities must be recognized, as determined many years ago in the older profession. About twenty years ago there were occasional minds so impressed with the necessity of more thorough efforts in the correction of malocclusion of the teeth that they decided to limit their practices to work of this kind. From this beginning, the specialty of orthodontia developed and was the second specialty in dentistry, being antedated only by exodontia (known at that time as the specialty of extracting teeth). Subsequently, developed oral surgery, prosthodontia and periodontia. The thought that orthodontia, like exodontia, was so distinct and separate from other dental operations, that there was little or no overlapping of labors or responsibilities, was responsible for its being among the first of the specialties to be established in dentistry. How true this is we will see later.

That other specialties will develop there is not the slightest doubt, but just in proportion as there is an overlapping of labors and responsibilities, will difficulties be encountered, for it is but human to blame the other fellow where possible. I am convinced that in the near future, there will be those who will give their entire attention and effort to the treatment and filling of root canals. This is made possible by the X-ray, for it would indeed be a bold man who would undertake such a specialty without being able to show in a positive way the results of his labors. That the laity will be better served when such a specialty is established, there is not the slightest doubt, for, the person who is doing any one thing all the time becomes more proficient than he

¹ Read before the First District Dental Society, S. N. Y., Feb. 5, 1917. See discussion, p. 233.

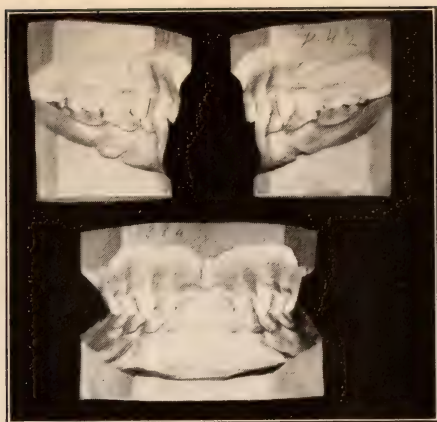


FIG. 1

Front and side views of normal occlusion of the deciduous teeth, when the second deciduous molars are in full eruption.

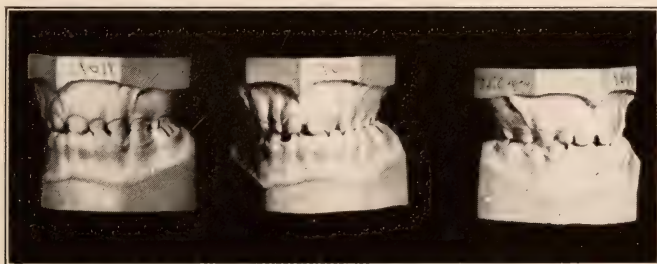


FIG. 2

Deciduous teeth in malocclusion, the teeth on the upper right side biting lingual to the lower ones.

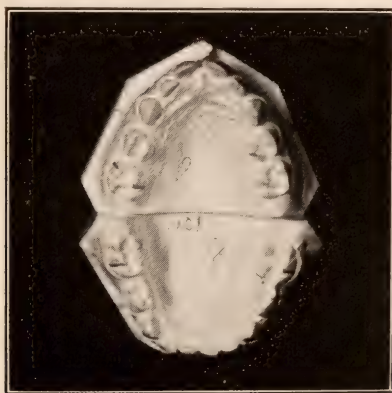


FIG. 3

Occlusal view of same case, showing that the upper and lower dental arches are practically of the same width in the molar region. This condition never prevails in normal deciduous dental arches.

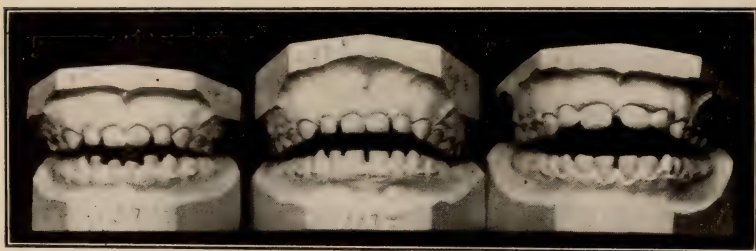


FIG. 4

Three sets of casts made at five, six and eight years of age respectively. The one on the left shows pronounced spaces between the deciduous teeth. The middle one has the lower permanent centrals erupted with spaces still between them and the approximating deciduous teeth. The one on the right side has all eight permanent incisors in eruption. This took place without any orthodontic treatment, and is Nature's method where normal eruption is not interfered with.



FIG. 5

How the permanent incisors develop back of, or lingual to the roots of the deciduous one. (Noyes.)

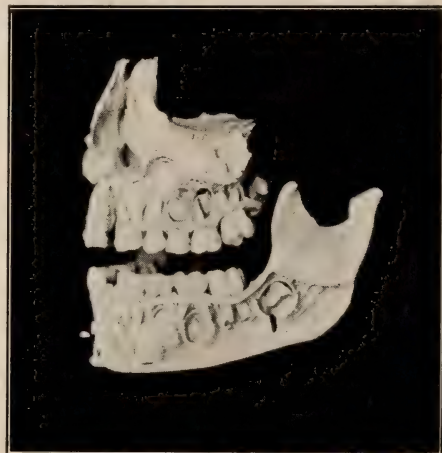


FIG. 6

How the cuspids and pre-molars develop in relation to the deciduous ones. (Noyes.)

whose attention is divided. As proof of this, consider the many things used in the various walks of life, that are made by artisans of mediocre ability, but fashioned with such ease and dispatch that the cost of production is very small, compared with what it would be if done by one with many other interests. These artisans become specialists in their particular labors and the products from their hands, when compared with those of the average are vastly superior, notwithstanding that the cost of production was less. Who would think in this stage of our civilization to set one man to build a modern house, he to manufacture everything that entered into it, from the raw material? To attempt this would be to set back the wheel of progress for centuries.

The first aim of the true professional man should be to serve his clientele in the best possible manner, regardless of his individual requirements or bank account. But some of us will argue that if we followed this course, we would have nothing to do, as Dr. A. is recognized as the best man in oral surgery and Dr. B. the best man in prosthodontia and so on down the line. The answer is for us to become as proficient as any one in our community, in some one or as many branches of our profession as possible and then refer to others such work as we do not feel that we can do in accordance with our ideals, for it is only by so doing that a conscientious professional man can continue in practice. How many of us take this view of our profession, and yet how prone would we be to criticize the medical practitioner who would without any previous training or experience undertake an appendectomy, particularly if the operation was on one of our immediate family and did not prove successful?

It does not follow that if the above conditions obtained, all dental operations would be satisfactory to the patient, for we differ in ideals as widely as we do in technical ability. But if we are conscientious in our efforts in every operation we undertake, always striving to do it better than the previous one and thus more nearly approach perfection, our ideals will rise in proportion as we improve in our technical ability, and this is the foundation of all professional progress, having always in mind the Golden Rule, "Do unto others as you would have them do unto you."

That we have in every large city in this country one or more specialists in orthodontia and that the number is rapidly increasing, proves conclusively that there are many members of the dental profession who recognize that this work can better be done by the specialist. It might not be amiss for us to consider here why this is so. One teacher of orthodontia has often been heard to proclaim that orthodontia and dentistry are like oil and water and will not mix. But why? Is it that orthodontic operations are more difficult and require a higher order of technical ability or a keener appreciation of the artistic? No. Then why? Orthodontia demands that the malocclusion be corrected. In order for us to correct malocclusion we must have a clear and definite understanding of this ideal condition which we are attempting to restore.

Normal occlusion implies that all the teeth in one jaw are occluding with the teeth in the opposing jaw, so as to furnish the largest area of grinding surface. The cusps, the inclined planes, and the sulci into which they fit should combine to furnish the owner with the best masticating apparatus, thus forming dental arches which in regard to strength and durability cannot otherwise be equaled. The cusps of all the grinding teeth in such arches, interlocking with their antagonists, tend to prevent these teeth from any variation in position either bucco-lingually or mesio-distally. This regularity of the teeth in normal arches is also one of the chief factors in their resistance to decay, and to disease of the surrounding tissues, for the teeth, if they are properly formed, are in a position to be as nearly self-cleansing as possible.

With this conception of normal occlusion, it is apparent that the loss of one tooth or of even one cusp of one tooth, or to be more exact, the loss of any portion of the mesio-distal diameter, will destroy to just that degree, both normal structure and normal function. It is also apparent to those who have seriously studied this question that it is of equal importance properly to restore the mesio-distal diameter of the deciduous molars where fillings have been inserted on their proximal surfaces. Hence, if we are properly to correct malocclusion, we must have in our mind's eye the form, surfaces, and the positions of the dental organs

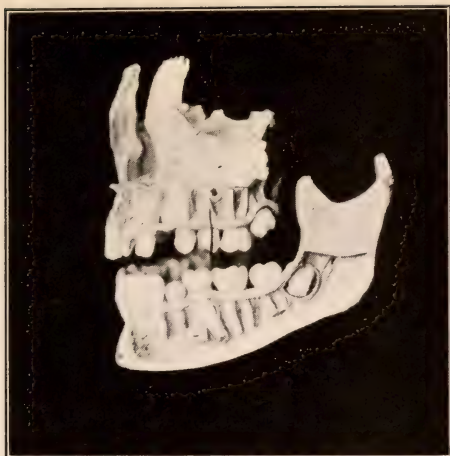


FIG. 7

The resorption of the roots of the deciduous teeth and the bone surrounding them. As the permanent tooth erupts new bone must develop to support it. (Noyes.)



FIG. 8

A diagrammatic chart, prepared by Dr. Wm. J. Brady showing development, eruption and resorption of the teeth, that I have found very valuable in explaining to the parents the necessity for early treatment of malocclusion.

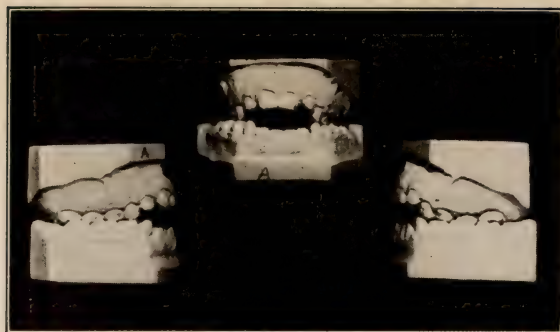


FIG. 9

The result of constant biting of the tip of the tongue, preventing the eruption of the permanent incisors.

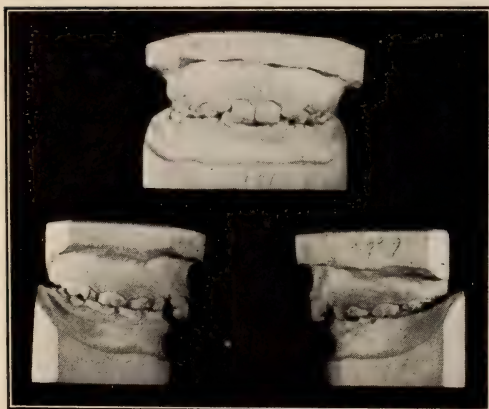


FIG. 10

The result of biting the cheek, forcing the lower molars and pre-molars of the left side, entirely lingual to those of the upper teeth.

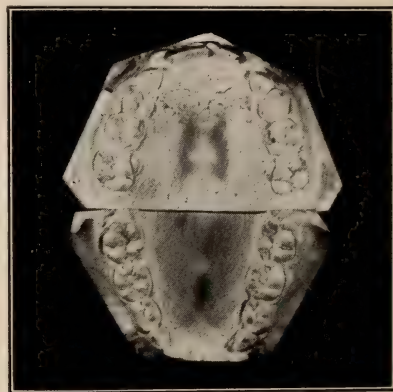


FIG. 11



FIG. 12

Casts of a child of eight years, that has always sucked the left thumb. Observe a slight distal relation in the molar region with a protrusion of the upper left central and lateral. The right side was practically normal.

when normal. The value of proximal contact, the proper occlusion of each cusp, the antagonist of each inclined plane, the size of each fossa, the shape of each sulcus and the direction of each groove should be known to him who aspires to assist nature to establish the normal.

When teeth are in malocclusion we must in some way be able to figure out from the beginning what must be done in order to put them in their normal positions. This can be done only by procuring a set of accurate plaster impressions in order to make casts of both dental arches, so that we can place the teeth of the arches in the position they now occupy and be able to study them from the lingual as well as from the buccal view. It is not a difficult thing to make a set of casts, I hear someone say. No. But the casts are of little value if we do not take time to study them and accurately determine just what is necessary to do. This is where the dentist usually makes his first slip. He does not take the time accurately to figure out what he must do with the teeth in malocclusion so as to place them in occlusion.

Orthodontic appliances, to be efficient and comfortable, must be so delicate that there is always a possibility of a break, and it is imperative that this should be remedied at once, for teeth relapse much faster than it is advisable to move them during correction. The busy general practitioner finds it difficult to care for these emergencies owing to lack of time with his full list of appointments, and consequently the work is neglected, and possibly forgotten for a time. Slip number two.

It is the duty of the dentist, in referring a case to be corrected, to see to it that the condition of the oral cavity of his patient is what it should be to receive a set of orthodontic appliances, for it must be remembered that in the majority of such cases, appliances of some sort will be required at intervals if not continually for several years, depending on the magnitude and complications of the case. All carious places should be filled and all roughened or etched enamel surfaces should be thoroughly polished according to oral prophylactic standards, so as to place the teeth in the best possible condition to be kept clean and free from bacterial masses during the orthodontic treatment.

It is the duty of the orthodontist before accepting a patient,

to impress upon him, the parent or his guardian, the importance of thorough cleansing of the teeth, and to state clearly and emphatically that any mechanical appliance placed in the mouth renders them more difficult to keep clean, but that if instructions are faithfully followed, it is quite possible to do so. It is also his duty to see to it that his patient has the proper tools with which to work. There are few adults who effectually care for their teeth. One reason of failure is that they work one tooth brush overtime, never giving the bristles a chance to dry and regain their elasticity. A tooth brush used more often than once during the day becomes inefficient. Brushes should be numbered so that the patient can readily select a fresh brush each time he brushes his teeth during the day.

The orthodontist should be willing to state at the beginning that he will assume the responsibility of guarding against any injury to the enamel surface or to the surrounding tissues under cemented bands, provided the patient will report for inspection at stated intervals. This will tend to make him more careful in his technic in fitting and cementing bands. In order to avoid complications he should emphatically state that it is not uncommon for initial cavities on the proximal surfaces of the teeth to be so small that it is impossible to discover them without resorting to a wide separation, particularly on the mesial surface of the first permanent molars. In fact these teeth are so generally affected owing to the very broad contact formed by the second deciduous molars, that it is almost permissible that he mark on his chart with a question mark, all such surfaces that have not been filled. It is obvious that any dentist can readily distinguish the difference between such a cavity and one caused by a loose or ill fitting band, but to the laity, a cavity in a tooth that has been banded is blamed on orthodontia and it is the duty of the dentist to enlighten his patients on such points, if he wishes to coöperate to their advantage.

The age at which patients should be referred to the orthodontist is a mooted question, but it is safe to state that ninety-five per cent of orthodontists will agree that all orthodontic treatment should be completed by the time the permanent teeth that replace the deciduous ones, are in full eruption. Orthodontia

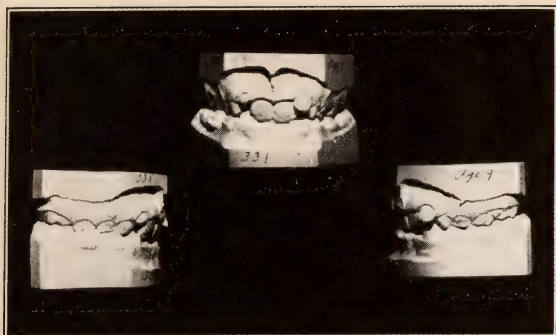


FIG. 13

Pronounced retrusion of both the upper and lower incisor teeth, the mesial-distal relation of the molars being correct. This condition was caused by contracting the lips.



FIG. 14



FIG. 15

Normal shape of the occlusal surfaces of the teeth. Note particularly the marginal ridge on the mesial-distal surfaces of every bicuspid and molar. Where these ridges have not been lost through dental caries, the danger of food particles being forced between the teeth is almost nil. In the restoration of the occlusal surfaces of the teeth with fillings and inlays, it should be the object of every conscientious operator to try to reproduce these marginal ridges.

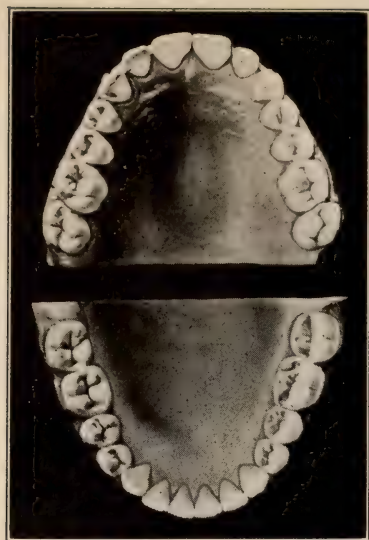


FIG. 16

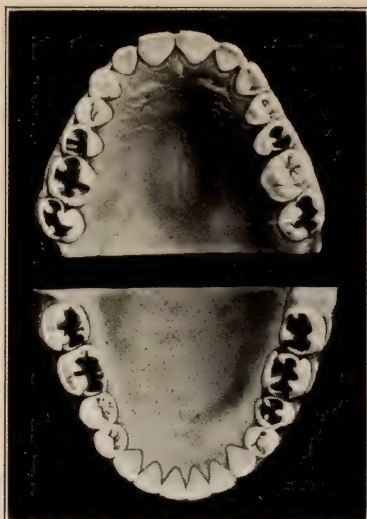


FIG. 17

A case having ten large gold inlays on the occlusal surfaces of the teeth where a good attempt has been made at anatomical restoration of the marginal ridges.
The same case with the inlays colored so as readily to be seen.



FIG. 18

Normal arrangement of the teeth from the buccal view.

then becomes an aiding process, and the final results the best that can possibly be obtained. It is proper to consider at some length why this is so.

The deciduous denture consisting of twenty teeth is complete at the end of the third year, and when normal, the lower teeth are found to be in a definite relation to the upper ones. The incisors both upper and lower are in contact with their approximating neighbors. By the time the first permanent molars are in full eruption, if normal development is not interfered with, there will be a decided change in the size of the deciduous dental arches, resulting in spaces in the deciduous incisor region, both upper and lower. Whenever such spaces fail to appear, it is safe to assume, that there will not be sufficient room in the anterior part of the arches to accommodate the permanent incisors when they erupt, owing to the fact that these teeth are always considerably larger than the deciduous ones which they replace. This lack of room for the erupting incisors frequently results in what might justly be considered impaction of a number of teeth. That this crowded condition of these teeth is responsible for reflex disturbances which result in baneful manifestations that work to the detriment of the child, is apparent to those who have seriously considered this subject. It is quite common for children at this age to develop habits of various kinds, such as tongue and lip biting, sucking the thumb or finger, biting the nails, biting the cheek, drawing in the lips in various ways, pressing the teeth with the tongue, licking the lips, etc. That these habits are the result of reflex disturbances, it is fair to assume. That such habits influence adversely the positions of the erupting teeth is generally recognized and if persisted in, the correction of the malocclusion is a useless process, as the teeth are certain to relapse as soon as freed from mechanical retainers.

Physicians have occasionally been known to advocate that infants be permitted to suck the thumb, on the ground that it prevents mouth breathing, but all who have encountered such cases will agree that of the two evils the latter is easier to correct.

It therefore becomes the duty of every dentist, as well as that of every physician, if he wishes to coöperate to the fullest extent for the benefit of children intrusted to his care, to be ever

watchful for such manifestations, so that he may use every possible means to break up such habits at the beginning, for the longer these habits are continued, the more difficult they are to overcome. It is a rare thing to find parents who are cognizant of the habits of their child, and when they are, they have not the slightest conception of the baneful effects of such habits. Whenever possible to ascertain the cause of the habit, the cure becomes far more certain.

As the root of the deciduous tooth is resorbed, the bone surrounding it is also resorbed, and as its permanent successor erupts, new bone develops around it to support it. Owing to the fact that the crown of the erupting tooth projects below the gums before the root is fully formed and, also, since there is never any attachment of any kind to the enamel surface of the tooth, it must be obvious that the pressure required to rotate or guide such a tooth into its proper position is very much less than that required to move a tooth in full eruption with the bony socket surrounding it fully formed. Is it not logical that when teeth are guided into their proper positions during the natural eruptive period, so as to place their inclined planes in an harmonious relation with their antagonists, that we are assisting nature to the greatest degree? Is it not fair to assume that teeth so moved are surrounded with bone far more normal in cell activity and structure and therefore better able to withstand invasions of disease, than where resorption of bone has been induced by mechanical means and the teeth held by some device until new bone has developed to sustain them? Who is there that will dare to assert just how long it is necessary to retain teeth that were in full eruption with their bony sockets and surrounding membranes fully developed before the moving process was instituted?

Observation has proven that wherever it is possible to have finished orthodontic treatment by the time the permanent teeth that replace the deciduous ones are in full eruption, that the buccal surface of the second permanent molars is far less liable to be attacked by decay than where these teeth are present at the beginning of treatment. This of course is due to the difficulty experienced in properly cleansing these teeth with appliances of any kind attached to the buccal surface of bands on the first



FIG. 19

Normal arrangement of the bicuspid and molars from the lingual view. This is really the most important aspect from which to view the occlusion of the teeth, and can only be done on the patient by means of casts.



FIG. 20

Cross section through the molar region. Please note how the buccal cusps of the upper teeth overhang those of the lower molars. Wherever this condition prevails, and the teeth are all present, there is little or no danger of biting the cheeks. (Cryer.)



FIG. 21

Shows that the dental profession is still advocating the extraction of teeth for the correction of malocclusion. Four first bicusps removed.

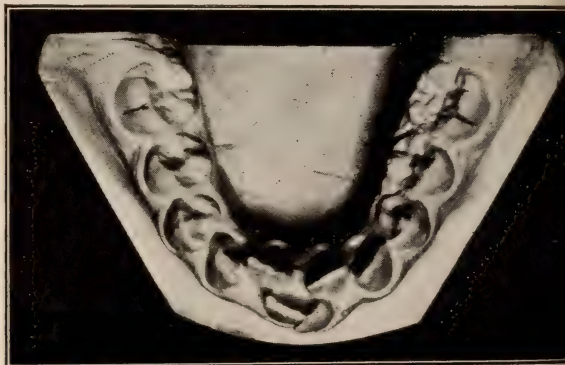


FIG. 22A

Occlusal view of pronounced case of malocclusion before treatment. See fig. 22 b.

permanent molars. It likewise follows that it is safer to band the first permanent molars whenever possible for anchorage for the appliance rather than the second deciduous molars, as any attachment on the buccal surface of bands on these teeth renders the first permanent molars more difficult to keep clean.

Other reasons why it is better that treatment should be finished at this age, are, that children do not object to appliances even if they show; that their tissues possess far greater recuperative powers; that the strain of their school work is lighter and that it is finished prior to puberty, which is usually a strain on both male and female.

In the face of the above how can any conscientious dentist advise parents to delay treatment until all permanent teeth are present?

Close observation will prove that children who erupt deciduous teeth early will usually erupt the permanent ones early, and if the dentist would bear this in mind, he would be the better able to know just when he should refer his patients so as to assure that they will derive the greatest benefit from orthodontic treatment. In all cases of Class II or Class III malocclusion, if treatment can be started prior to the eruption of the first permanent molars, the final results will be found to be more satisfactory to all concerned.

That many parents consult an orthodontist without being referred to their dentist must tend to prove that the members of the laity are far more interested that their children develop normal occlusion than are their dentists, and it is they who should answer why this is so. The great majority of such children are found to possess pronounced malocclusion and many of their mouths are woefully neglected, both as to oral prophylaxis and filling of initial cavities. Can it be possible that such conditions are due to negligence of the parents? If so, then why are they so anxious about the malocclusion?

Many of these parents coöperate to the fullest extent during the corrective treatment and when the children are referred to their dentists to have the teeth and mouths put in a proper condition to receive orthodontic appliances, they not infrequently return with the statement that the cavities have all been filled;

yet one may find that prophylactic measures have been neglected and often deep cavities in the occlusal surfaces of the permanent teeth have not been filled. It is obvious that this places the responsibility for such conditions where it belongs.

As apropos to the subject, I quote from a paper by Dr. Grace Rogers Spalding under the title of "Practical Measures of Preventive Dentistry for the Orthodontist," published in the January, 1917, *Dental Items of Interest*, as follows:

"It is difficult for a specialist in our profession to obtain from the general practitioner that complete coöperation which is so essential to success in the ultimate results. There is no specialty of dentistry which is so dependent upon correct dental restorations as orthodontia. In other specialties faulty dental operations are usually recognized before irreparable injury has been done, while in orthodontic cases the shifting of teeth back to their original positions, due to faulty contour, defective contacts and imperfect occlusal restoration is usually so gradual that the occlusion of the teeth may be changed and the purpose of the orthodontist's work entirely defeated before this is discovered."

To offer a solution for this problem is exceedingly difficult, since there will always be dentists and *dentists*. As dental art advances, the technic of the individual operator will naturally improve, but the writer believes that the inevitable solution will eventually be the prevention of all cavities for orthodontic patients during as long a period of time as the patient is under the observation of the orthodontist. After this there should be but little difficulty in preventing caries, for such a patient would probably give his teeth, which would then be in normal or nearly normal occlusion, that intelligent care which alone can and does prevent dental caries. If only the prophylactic specialists and the orthodontists could coöperate to such an extent and together care for a sufficient number of cases to verify conclusions according to our present enlightenment in this direction, the result would be a step forward in preventive dentistry.

In this connection it is deemed advisable to insert two quotations from a paper by your essayist published in the *Dental Items of Interest*, May, 1913, entitled "Restoration of Occlusion by the Casting Process."

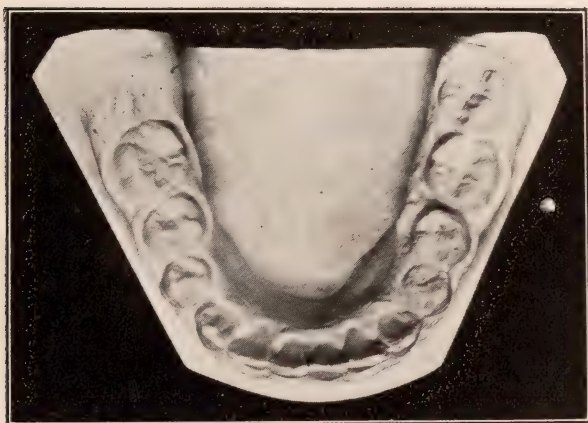


FIG. 22 b

Occlusal views of a pronounced case of malocclusion after treatment. See fig. 22 a. These prove the fallacy of such treatment.

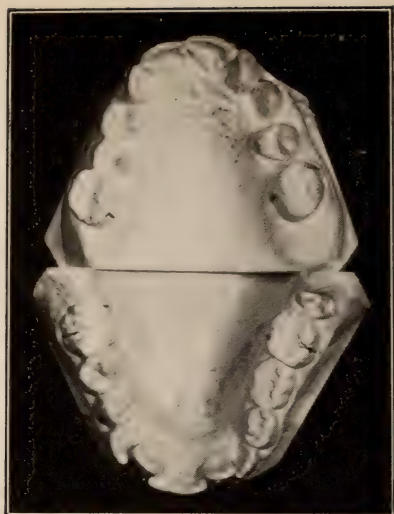


FIG. 23

The occlusal view of a case before treatment. Observe the upper right lateral almost in contact with the bicuspid and the upper left first molar almost in contact with the first bicuspid.



FIG. 24

Dental arches developed sufficiently to accommodate all of the teeth.

"Did it ever occur to you that the orthodontist often works for years to build up this normal occlusion, only to have it pulled down in a day by the ruthless extraction of a single tooth, or by the lack of restoration of cusp contour or proximal contact in making fillings or inlays?

"It would seem, therefore, that the dentist must share the responsibility of the orthodontist in emphasizing the importance of normal occlusion by preserving it at all times, or at least by not destroying it.

"One of the great difficulties experienced by the orthodontist is to retain the mesio-distal relation after it has been established. Very frequently this trouble is due to improper fillings, or inlays, on the occluding surfaces of the teeth, particularly those of the lower first molars. If these restorations can be made so as to reproduce accurately the original shapes of these teeth, and thus permit the large mesio-lingual cusp of the upper first molars properly to seat itself each time the teeth are closed, do you not see what a powerful influence is exerted by the action of the inclined planes of this cusp on the inclined planes of the cusps of the lower first molar, to prevent a return to a mesial or distal malocclusion, and do you not see that to a proportionate degree each reproduction of the normal occlusal surface of a tooth exerts a like helpful influence? Where all restorations accurately reproduce the original anatomical land-marks, the orthodontist will experience much less difficulty in the retention of such cases."

Occasionally parents who have had their dentist begin treatment of malocclusion for their children, become dissatisfied and consult an orthodontist. In such cases if the appliances are in place, it is the duty of the orthodontist to refer such a patient back to their dentist so that he may remove them, and not till then is the former at liberty to have anything to do with the case. In like manner a dentist should not for any reason remove for his patient, appliances put on by an orthodontist, but should refer them to the man who put them on for removal, and due courtesy should demand that he communicate to the orthodontist, his reason for desiring their removal.

If a patient should decide to change from one orthodontist

to another, which he has a perfect right to do, the second orthodontist has no right to consider the case as long as the child is wearing appliances unless he has received permission from the other to proceed with the case.

In all such cases where a patient changes from one practitioner to another for orthodontic treatment, it is the duty of the first operator to deliver to the patient the original casts and photographs if such have been made (provided of course that all financial obligations have been settled), coöperating in every way that will best serve the patients interest, for it is obvious to every orthodontist that to treat a case without possessing casts of the original positions of the teeth, places him under a handicap, and this is not for the best interest of the patient.

It is not uncommon for dentists, in referring a case of malocclusion, to give the parent the names of several orthodontists, so that he may have a choice. This is a practice we cannot too strongly condemn. It is far better that he should decide who would be the best qualified to suit the individual needs of his particular patient and send him to that person. The patient will be far better satisfied and the dentist much less annoyed, and he will save himself the humiliation of stating to the patient which one of the number he considers the most competent.

576 Fifth Avenue, New York City.

STUDIES OF THE INVESTING TISSUES OF THE TEETH AS A GUIDE FOR TREATMENT OF CHRONIC ALVEOLAR ABSCESS AND SUPPURATIVE PERICEMENTITIS¹

By ARTHUR D. BLACK, A.M., M.D., D.D.S.

Chicago

IN reviewing the literature of recent years devoted to those chronic mouth infections which are a menace to health, one is impressed with the fact that the dental profession is not inclined to give serious attention to those problems, an understanding of which is the necessary basis of rational treatment. In almost every issue of a dental journal, someone tells us what will cure a chronic alveolar abscess, and what will cure a case of chronic pericementitis. The presentation is often without premise, argument or logical conclusion; it is simply claimed and admitted that the particular treatment will effect a cure, and that's all there is to it. Why say more? There is no reason to say more if the profession asks for no more.

I read recently a testimonial which the wife of a man who had been ill with pneumonia had written stating that the husband had recovered because Voliva, the head of the Zion Church, had prayed for him. Why inquire further?

In years gone by we have been told that phenol forced through an abscessed tract would cure the abscess; we have been told that iodine and many other drugs would do the same. We have been told that pus pockets would heal if we packed them with powdered copper sulfate, or if we planed the roots and applied any of many antiseptics or other "remedies." We

¹ Read before First District Dental Society of the State of New York, March 5th, 1917. This paper was illustrated by about forty lantern slides, five of which are presented herewith. See disc., p. 253.

have been told that bismuth paste will cure these cases, that ionization will cure them. Why inquire further? We surely have enough cures which are "fully guaranteed." While each of these methods may have been more or less successful, the idea is wrong in principle. We should endeavor to gain full knowledge of the conditions and possibilities in each case and then determine our treatment for the particular case.

The chief object of this little tirade is to impress the fact that we are not giving enough consideration to the tissues which are involved. If one has an inflammation which destroys the retina, it is not expected that sight will be restored; if the labyrinth of the ear is involved in an inflammatory process, and the terminals of the auditory nerve in the internal meatus are destroyed, we do not expect that hearing will be restored; if the cells composing the matrix which forms the finger nail are destroyed, we do not expect the continued formation of the nail; if the hair follicles are destroyed over a considerable area of the scalp, the person is bald headed and we expect him to remain so, regardless of the fact that the time will probably never arrive when there will not be a good sale for remedies which are guaranteed to make the hair grow again.

In each of the above instances something has occurred and as a result the more highly specialized cells have disappeared, leaving a tissue of a more ordinary type. This commonly happens when tissues containing specialized cells are involved in inflammatory processes.

We have not studied with sufficient care the histologic structure and physiologic functions of the tissues which are concerned in chronic alveolar abscess and chronic suppurative pericementitis. Possibly there is something analogous between the denuded cementum and the bald head.

The most striking feature in the pathology of the chronic abscess and the pus pocket is the denudation of the cementum. As a result of a suppurative process, the peridental membrane is detached from the cementum and, the detachment being maintained for a time, certain tissue changes occur which should be clearly understood as a basis for determining rational treatment. The cementoblasts of the area are destroyed, the fibres

of the peridental membrane, which are detached, gradually disappear from the overlying tissue; likewise the corresponding area of bone of the alveolar process is destroyed or absorbed. The detached tissue, irritated by the contents of the pocket, and possibly by deposits of calculus on the cementum, becomes an inflammatory tissue and is invaded by microorganisms from the pocket. The cementum becomes saturated with the products of the suppurative process, the cement corpuscles die; the cementum is practically a necrosed tissue, but it can not be exfoliated because there is no circulation of blood in cementum as there is in bone.

What then is the problem which confronts us when we undertake the treatment of such an area with the hope of securing a reattachment? The cementum itself is an entirely passive tissue; no activity may be expected of it. The cementoblasts, the only cells which can lay down new cementum have been destroyed, as have been the fibres of the peridental membrane which would normally be embedded in the cementum. While it may not yet be fully proven that there can be no regeneration of these specialized elements, it seems no more likely than the regeneration of the terminals of either the optic or auditory nerve, or of the nail matrix, or the hair follicles, when these are destroyed.

The condition of the cementum is of greatest importance in this connection. To have an attachment of any kind, whether it be normal peridental membrane or a simple adhesion of the overlying connective tissue, the soft tissue cells must necessarily live in physiological contact with the cementum. There is no more prospect of reattachment to pus soaked cementum than there is of the attachment of soft tissue to a sequestrum of necrosed bone. The cementum, by the absorption of the products of the suppurative process, has become a negatively chemotactic tissue; attachment of any kind is out of the question. It is a bald head.

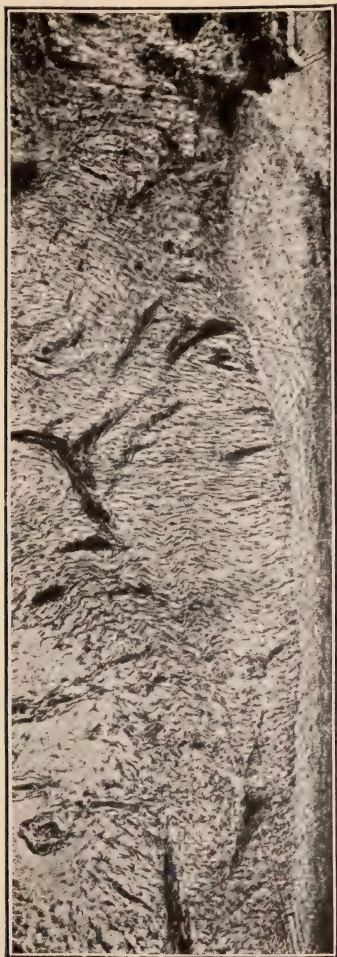
There are two phenomena which have a bearing on these cases. In the examination of microscopic sections of teeth, a fair percentage will be found in which areas of cementum have been absorbed and rebuilt, and the fibres of the peridental

membrane, which were doubtless cut off when the absorption occurred, have been imbedded within the cementum which was laid down to fill the absorbed area. This would lead us to hope that there might be a building in by the cementoblasts which surround areas of detachment in cases of abscess and pus pocket formation. It should be pointed out, however, that these absorptions and rebuildings have not been associated with suppurations; that the process has been a physiological one, the absorption having apparently occurred as the result of some unusual pressure on the tooth. It should also be remembered that in these cases the fibres of the peridental membrane remain intact and in position for reattachment.

The other phenomenon is that of the implanted, transplanted or replanted tooth. Why do the soft tissues form attachment to some planted teeth and not to others? Doubtless infection defeats attachment in some cases. It seems to be a biological problem, explained by the condition of the root as to positive or negative chemotaxis. We know that the tooth will be rendered negatively chemotactic by immersion in almost any antiseptic, however mild, and no attachment will occur. This is strong evidence against the use of antiseptics in all cases of alveolar abscess or chronic pericementitis. It is quite evident that there is no true peridental membrane about those planted teeth in cases in which the soft tissues attach themselves; the attachment is an unstable one and the root is gradually cut away by absorption.

In the case of the chronic abscess it has been recommended that the root end be resected, thus removing the involved cementum, leaving dentin exposed to which the soft tissues might form an attachment. Sufficient studies have not been made to prove that attachment does occur, although the evidence in at least a limited number of cases seems to be favorable. It is important that many such be followed for years by roentgenographic examinations, and that those which have apparently been successful be examined by a competent histologist whenever the occasion presents for the extraction of a planted tooth.

In cases of chronic pericementitis it has often been recom-



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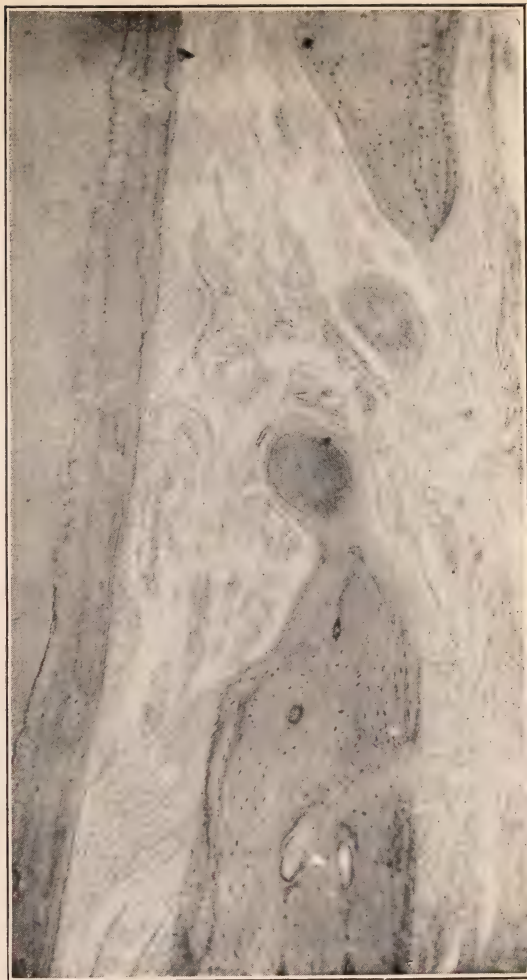


FIG. 1

Normal periodontal membrane. Section showing fibers attached to the cementum from the gingival line almost to the apex of the root. The section is not quite parallel with the long axis of the tooth and is a little to one side of the apex of the root. The fibers which pass upward into the gingivae, those which pass to the crest of the alveolar process, and those which pass directly from the cementum to the bone are clearly shown as a practically solid mass from the gingival line to the end of the root. Photomicrograph by Dr. F. B. Noyes.

FIG. 2

Section through root and labial alveolar process of an upper central incisor, showing about one-fourth of the root close to the apex. Patient forty years of age. The periodontal membrane on the lingual side of this tooth was detached almost to the apex and the pocket extended around on both the mesial and distal sides of the root, but was not so deep on either mesial or distal, as on the lingual. This tooth was extracted by Dr. Arthur D. Black, May 27, 1912. With the patient under nitrous oxid anesthesia, two incisions were made through the labial gum parallel to the length of the root and a third incision was made horizontally above the position of the apex, meeting the other two. The alveolar process was cut through with a drill in the engine along the same lines, and the tooth with the labial periodontal membrane, alveolar process and gum tissue were all removed together. This illustration should be compared with Figure 1. Marked changes have taken place in both the periodontal membrane and alveolar process. Many of the fibers have disappeared. One strong bundle of fibers remains toward the apex of the root; another fairly good bundle is seen near the top of the illustration. Section prepared and photomicrograph made by Dr. F. B. Noyes.

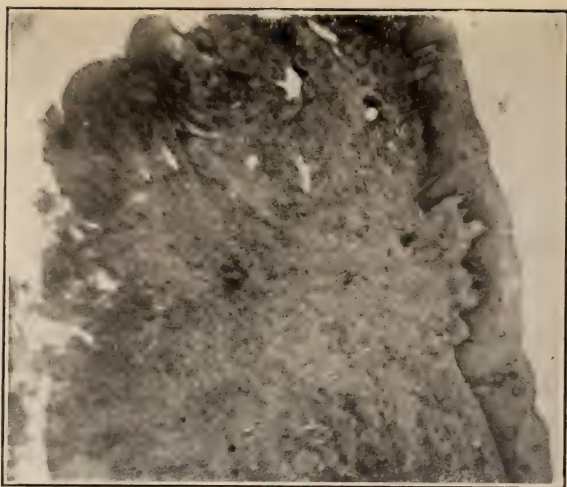


FIG. 3

Section through soft tissue overlying a deep pocket of many years standing on the labial side of the root of a lower left cuspid; from about the middle of the length of the root. Patient sixty-five years of age. Tissue cut away by Dr. Arthur D. Black on September 29, 1913. Normally the crest of the alveolar process should be present in a section cut in this position. The bone has all disappeared, as have practically all of the fibers of the periodontal membrane. Section prepared by Dr. H. A. Potts, photographed by Dr. F. B. Noyes.



FIG. 4

High magnification from very near the center of section shown in Figure 3. The normal cells of the tissue have practically all disappeared and have been replaced by inflammatory tissue. By what process of treatment might we expect to have a regeneration of these elements necessary to a stable reattachment to the cementum? Section prepared by Dr. H. A. Potts, photomicrograph by Dr. F. B. Noyes.

mended that the outer portion of the cementum should be removed with scalers, in the hope that reattachment would occur. Attachment would certainly be possible if the remaining surface were positively chemotactic. Unfortunately the cementum is so porous that it has, as a rule, absorbed the products of the suppurative process to its full thickness, before treatment is instituted. The removal of the full thickness of the cementum and the exposure of the dentinal tubules, presents a less favorable prospect for attachment than does the end of the root following resection in cases of abscess, because of the greater danger of immediate reinfection of the area, and the absorption by the dentin of the products of the suppurative process.

It has been suggested that cases of both groups may be cured by ionization. Granting for the purposes of this presentation, that under proper conditions, antiseptic ions pass from a positive pole held in the pus pocket or in the root canal, what may be accomplished by this? It is claimed that the ions will penetrate the surrounding tissue and destroy the microorganisms which may have invaded it. Granting that this is so, what benefit will result; is there any reasonable hope for a reattachment of the soft tissue to the cementum? There certainly is not, unless the condition of the cementum has been changed. We have no assurance that ionization does not actually do more harm than good, if we may judge from the effect of antiseptics generally. We should remember that it is a very simple procedure to clear almost any abscess cavity or peridental pocket of infection by washing it thoroughly with sterile water, and we may then, in most cases, rely on the tissue itself to destroy those organisms which have penetrated it. But this does not result in reattachment.

It is for the same reason that all attempts at serum therapy have failed in these cases. Even though a proper autogenous vaccine is injected, and even presuming that the infection is entirely cleared up for the time being, there is no reattachment, and the benefit is transient.

While the infection of the soft tissues is of first importance as a menace to health, it is really of little consequence in con-

sidering the question of reattachment. It is well known that the soft tissues are amply able to take care of themselves as soon as the constant irritant—the pus soaked cementum—is eliminated. It is a matter of but a few hours after the extraction of the tooth, until the previously inflamed tissues have entirely cleared up the infection. In these cases, may I ask what becomes of the organisms which had invaded these tissues? Their quick destruction is sharp evidence of the defensive role which the soft tissues perform in these cases.

In the light of our present knowledge, it seems that we can not do better than to establish rules for treatment on the dictum of G. V. Black² that “Suppurative detachments of the peridental membrane are permanent detachments.” If we shall come to realize this, the management of cases is much simplified. We may then lay down tolerably definite rules covering cases in which radical treatment by extraction, or root resection in cases of chronic abscess, will be proper. In cases of chronic pericementitis, pockets of shallow depth and in certain positions will be favorable for palliative treatment. We will reduce the depth of some of these by cutting away the overlying unattached tissue; then we will train the patient to keep them clean by washing them with salt solution, using a syringe designed for the purpose.

But what is most important of all, if we come to appreciate the fact that a gingivitis always precedes the pericementitis, and if we study carefully the various causes of gingivitis, we will soon realize the large opportunity before each of us for preventive treatment. Probably more than seventy-five per cent of cases of chronic pericementitis are easily preventable by the dentist by very simple means which all may employ. It is unnecessary to enumerate the causes; we all know them. It is absolutely imperative, however, that we appreciate the fact that a little redness or swelling of a gingiva is the forerunner of the pus pocket. If we see the relationship, we must take the gingivitis seriously. Once this is done, each operation, whether it be filling, inlay, crown, bridge, denture or scaling, is performed with the idea of preventing or curing an inflammation of the gingivae.

Success in preventive treatment requires that careful exam-

² Special Dental Pathology, page 185.

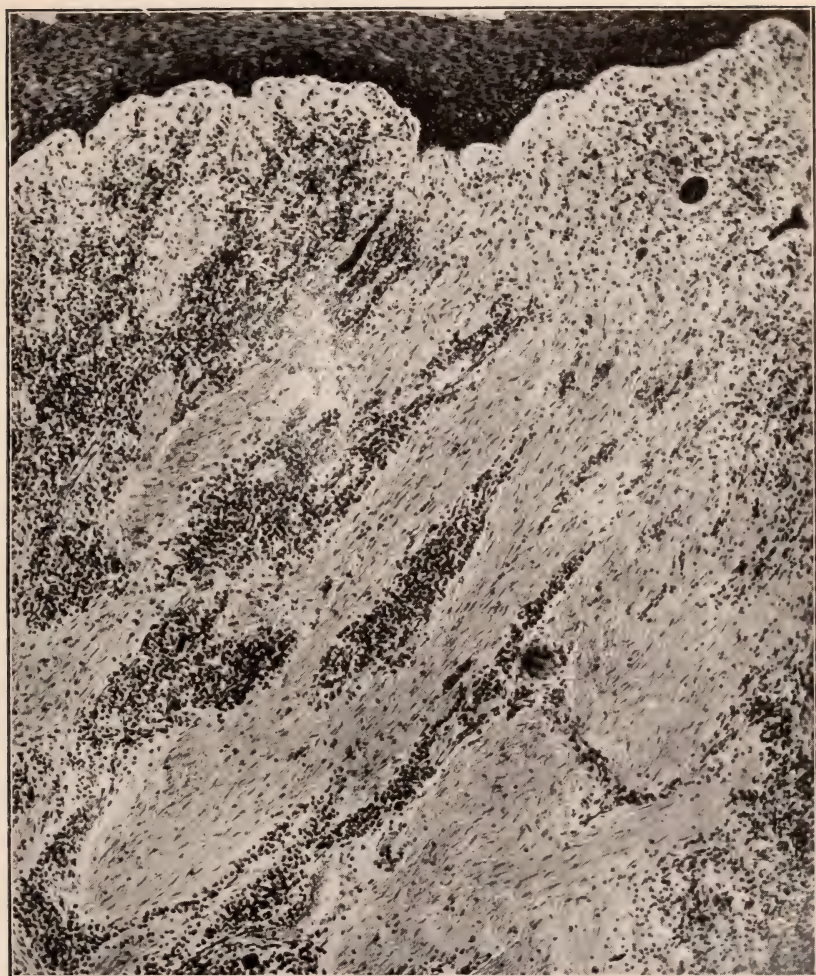


FIG. 5

Section through soft tissue overlying a pocket on the buccal side of the mesial root of a lower first molar, of possibly three to five years' standing. Patient thirty-five years old. Tissue cut away by Dr. Arthur D. Black, August 3, 1914. The epithelial covering is shown at the top of the illustration, the lower part being toward the root. Bundles of fibers are seen, with much round cell infiltration. Specimen prepared by Dr. H. A. Potts. Photomicrograph by Dr. F. B. Noyes.



inations of the gingivae be made and recorded. This is more important than an examination for cavities in the teeth. It is surprising how many areas of slight inflammation may be overlooked by one who has not trained himself in such examinations. Ninety-five per cent of adults have such inflammations, and the average number of areas is about eight per month. This does not mean that a case of pericementitis may be prevented every once in a while; it means that the opportunity is with us constantly, it should be a part of every operation. The dental profession does not need specialists in the treatment of the diseases of the peridental membrane as much as it needs every dentist to be a specialist in the prevention of these diseases.

122 S. Michigan Boulevard, Chicago, Ill.

THE SIXTH ANNUAL JOURNAL CONFERENCE

A MOST interesting, instructive, and cheering meeting of the Publication Board, Associate Editors and friends of THE JOURNAL OF THE ALLIED DENTAL SOCIETIES convened about 3 P. M. at the Republican Club of New York City on Saturday, the third of March, 1917, under the customary chairmanship of our good friend, Dr. William Rice, who started the ball rolling with a few inspiring remarks. Dr. Barrett received the nomination for Secretary for the day and was elected on vote.

Dr. S. E. Davenport, Jr., the Secretary of the preceding Conference, read his report of the proceedings of that meeting, as since published in the JOURNAL, and it was duly accepted.

Dr. Karl C. Smith, the Treasurer, rendered his report and explained how the financial affairs of the JOURNAL were now being handled by a firm of public accountants under his direction.

Dr. S. E. Davenport was next called upon, and rose amid hearty applause, to give his report. As always, Dr. Davenport was listened to with great interest, while he gave in considerable detail a résumé of the cost of publication of the last four issues, as compared with preceding issues. While the JOURNAL has remarkably improved in text pages, etc., the increased cost was very much more, largely due to the well-known rise in the cost of paper, materials, labor, etc., as well as an increase in the copies needed for increase of circulation, and so on.

The following newly added members of the Editorial Staff were then announced:

Dr. B. B. Palmer, Jr., Business Editor.

Dr. C. G. Fletcher, Assistant Business Editor.

Dr. Leland Barrett, Secretary.

Dr. Davenport concluded by announcing the proportionate amounts contributed by the Allied Societies for the publication of their material.

Dr. Dunning, the Editor, being introduced, reported that the

affairs of the JOURNAL were in good condition. He called special attention to the newly increased Editorial Staff, now comprising twelve men, who are, he believes, in full sympathy with the ideals of the Advisory Board, and stated his belief as to the necessity for incorporating the JOURNAL, in view of our growing responsibilities, this having been under consideration for some time. General discussion took place on various phases of the question, and finally the motion was unanimously carried that "we in conference assembled do incorporate." A committee on incorporation and by-laws, with power to act, was then elected, consisting of Drs. Davenport, Dunning, Kemple, Potter and Proctor.

Dr. Palmer, the new Business Editor, read his report, embodying several late accomplishments of his department, as follows:

(a) The systematizing and card-indexing of all paid subscribers, to avoid dead subscriptions, and so on.

(b) A definite plan of commission arrangements with the supply houses and magazine agencies.

(c) The appointment of a public accountant to supervise all financial details.

Future aims:

(a) An increase of 100% in paid subscriptions, by circulars, etc., to the agencies.

(b) To reach subscribers in the medical profession.

(c) The possibility of having a "JOURNAL" booth at the coming National Dental Association in the Fall.

Dr. Carney, of the advertising department, then took the floor and gave some interesting statistics showing a practical growth of about double space at first-class rates, all material being of the highest character, and all advertisements conforming to the highest standards.

On inquiry by Dr. Delabarre, it was announced that two societies are negotiating for the publication of their transactions in the JOURNAL, and thus joining the Alliance.

Other matters of less interest were brought up and settled, but need not be mentioned here, and so the afternoon passed most pleasantly and profitably. Two motions were made, which must not be omitted, one by Dr. Davenport, a vote of thanks to Dr.

William Rice for his grace and courtesy in presiding at this day's meeting; the other for the re-election of the same Dr. Rice as Chairman of the Publication Committee. On vote, both motions were unanimously carried.

And then the meeting adjourned.

It is interesting to know that twenty-one of the most distinguished dentists in Boston and vicinity made the trip to New York, the details having been arranged by Dr. A. G. Richburg, the tireless. These gentlemen were entertained during the morning by many interesting reels of dental films at the rooms of the Clinical Films Company, in Fortieth street. At one o'clock luncheon was served at the Republican Club to a company of about fifty, and next in order came the Conference itself, as described.

The evening session reconvened in the same room to partake of the excellent dinner planned by the Committee, commencing about seven o'clock, and followed by a mental program administered by several of our guests and members, Dr. Dunning being the toastmaster. After his address of welcome, he was interrupted by Dr. Rice, who in a series of most complimentary remarks, presented him, on behalf of the Boston friends, a handsome gold pen for his editorial use. And then shortly afterward Dr. Eugene H. Smith did the same thing to Dr. S. E. Davenport, Jr., for the same reasons and the same purpose. Both recipients were surprised, to say the least, but rallied and responded nobly.

The program of speeches was as follows:

"Welcome to New England Guests," Dr. Dunning.

Response, Dr. W. H. Potter.

"THE JOURNAL," Dr. B. B. Palmer, Jr.

"Interesting Item of JOURNAL History," Dr. H. L. Wheeler.

"Does THE JOURNAL Fill a Professional Need?" Dr. F. A. Delabarre.

"Professional Journalism," Dr. H. W. Gillett.

"The Relation Between THE JOURNAL OF THE ALLIED DENTAL SOCIETIES and THE NATIONAL DENTAL JOURNAL," Dr. H. H. Piper.

Many interesting remarks on the past, present and future of our JOURNAL were embodied in the speeches of these gentle-

men, but as the Secretary is not an expert stenographer many a good thought has been lost to history. However, the general keynote seemed to be optimism for the future, with a very helpful spirit manifested by everyone present, without exception. There is apparently no reason why the JOURNAL should not go on increasing its radius of influence for the betterment of the dentists and the dental profession at an even faster rate than in the past.

LELAND BARRETT,
Secretary.

THE JOURNAL,

By BISSELL B. PALMER, JR., D.D.S.

Mr. Toastmaster and Gentlemen:

Because our Journal has for its object the advancement of the dental profession in general, and the cause of dental independent journalism in particular, I feel highly honored in being invited to respond to this toast.

Whenever we speak of advancing our profession, our thoughts naturally turn to the goal toward which we are striving; and I believe we all agree that our ambition is to elevate the dental profession to the side of her sister profession—medicine. This goal cannot be reached in a day, and we must all realize that there is a long, heart-trying struggle ahead of us. If in that struggle we ever become pessimistic, we can gain new strength and courage from the thought that the medical profession has not always been on its present high plane.

Not so very many years ago, the profession of medicine had the same battle before it, which we now face. A small group of progressive men, inspired with high ideals, fought for the advancement of their profession against just such unseen forces as are now arrayed against us. That handful of men accomplished their purposes, and its result, the revered medical profession of today, with its high standards and ideals, should be our star of encouragement—for what man has done—man can do!

The dental profession to-day is suffering from auto-intoxication emanating from two focii of infection—

The First: Commercialism in our dental education, as exemplified by the dollar chasing, inefficient type of most of our proprietary schools, which graduate annually hundreds of dollar chasing, inefficient dentists.

The Second: Commercialism in our dental journalism—the publication of our professional proceedings in periodicals conducted by dental supply companies for the sole purpose of

¹ Address delivered at dinner following Sixth Annual Conference, JOURNAL A. D. S., Republican Club, New York City, Mar. 3, 1917.

increasing the sales of their goods. There is no more righteousness nor ethical fitness in publishing our proceedings in such trade-house organs, than there would be in the Rockefeller Foundation publishing the results of its medical research in periodicals conducted for the sole purpose of increasing sales of Omega Oil or Carter's Little Liver Pills.

The standard treatment of an individual suffering from a toxemia, is first to discover the cause of the condition and then remove the cause. We can apply the same treatment to the dental profession. I have named the focii causing the malaise suffered by our profession—let us now consider a means of eradicating them.

In New York City during the past year we have worked very hard and successfully for the establishment of a school of dentistry in Columbia University. At an early date an interesting statement regarding this school will be made by Columbia. I can tell you now however that two years of academic work will be the entrance requirement for students, and the course will be four years in length. During the first two, the dental students will take the same course with the medical students in the College of Physicians and Surgeons of Columbia University. We shall graduate dentists fully equipped to perform operations of scientific merit, and fully aware of their responsibility to their patients. To such dentists, the medical practitioner will offer the hand of coöperation, and together they will work for the welfare of mankind.

Similar schools must be established all over the country and we must support them and divert students from the proprietary schools into those dental schools conducted along university lines. We must point out to prospective students that a proprietary school managed as a business proposition and conducted for dividends, cannot give the student the type of education offered in a university dental school, supported by endowments and willing and able to spend more in educating its students than it receives from them. With these facts broadly preached, proprietary dental schools will soon be forced to give the same standard of education maintained in university dental schools, or else shut their doors. With the elimination of proprietary dental schools

and their evils, our profession will have rid itself of just half the cause of its ill health.

The strongest and most effective blow yet struck for the cause of independent journalism in dentistry was the recent publication of the masterpiece on the subject by Prof. Gies. That article has been spread all over the country and is now arousing our profession to a shamed consciousness of the state of its journalism. We must deliver blow after blow of just this same educational character, until we have gained the support of the entire dental profession for the cause we work for.

What part is the Journal of the Allied Dental Societies to take in this great movement? In my opinion our cause can be best advanced by making the Journal an absolute and undeniable success. So far as the standards of our literature and advertisements are concerned, and our ability to meet our financial obligations, we are already a success; but I believe we can never accomplish our full purpose until our Journal is published monthly instead of quarterly. A person meeting another four times a year is apt to be nothing more than an acquaintance; a visit each month, however, is more likely to lead to friendship. This holds true of many publications and certainly our Journal can be helped by more friends.

Before we can convert the Journal into a monthly magazine, several preliminary moves and preparations must be made:—

First: It will be necessary to bring more societies into the Alliance, so that we shall have sufficient literature contributed to justify monthly issue.

Second: We must increase the number of our subscribers and advertisers so as to be able financially to meet the increased expenses due to eight more issues per year.

Third: We must add to our editorial staff so that the great increase in work will not fall too heavily upon a few men.

We must all work together to bring about the three adjustments I have just spoken of, so that at the earliest possible date we may issue our Journal on a monthly basis. Such an accomplishment will be far-reaching in effect.

When we show that it is financially possible to publish an independent, monthly dental journal of high quality, the death

knell of subsidized dental supply house journalism will be sounded. Right-minded and right-hearted dentists all over the country will take encouragement and bring forth many independent journals, for they will realize that no one monthly journal can possibly publish all the interesting and valuable current dental literature.

A statement made by one of our friends at the conference this afternoon was that "We strive to build—not to destroy" and the expression was well received. I cannot accept that statement as the full doctrine of our cause, for while it is true that in the main we are striving to build up a truly professional journalism—yet it is equally true that we work to destroy and supplant the pseudo-philanthropic dental supply house journalism.

While awaiting the day of independent journalism, however, our current dental literature must be published, and if we have not enough independent periodicals to carry that literature, then I suppose it will appear in supply house journals and we shall have to suffer the shame of it.

However, the day that finds the dental profession ready and willing to publish all of its literature in its own journals, will also find a profession up in arms to wipe out the blot of supply house journalism. When that day comes an effective and thoroughly organized campaign must be inaugurated along the following lines:—

First:—Organize the dental societies of the country into a league and have them agree not to publish their proceedings in journals other than those acknowledged to be strictly independent and professional.

Second:—Organize the dental essayists of the country into a league and have them agree not to read papers before any society which publishes its proceedings in a dental supply house journal.

Third:—Organize the dentists of the country into a league and have them agree not to subscribe to dental supply house journals.

The foregoing program is entirely feasible and its vigorous prosecution at the proper time will surely break the shackles which now bind our profession to mercenary trade influences.

May the proper time come soon!

NEW FINDINGS IN STUDIES OF THE VALIDITY OF MARSHALL'S SALIVARY FACTOR AS A MEANS OF DIAGNOSIS OF DENTAL CARIES¹

By WILLIAM J. GIES and collaborators

(From the Biochemical Laboratory of Columbia University, at the College
of Physicians and Surgeons, New York)

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I

In the last of our four discussions of Marshall's salivary factor, we wrote as follows (*loc. cit.*, p. 83):

"Results of our further tests of the diagnostic validity of Marshall's salivary factor have shown, as I stated at the meeting of the First District Dental Society of the State of New York last November (1916), that this factor is worthless for the diagnosis of dental caries. Our new results, obtained independently by several collaborators, will constitute a separate section of another portion of our report for 1915-'16, to be published in the succeeding issue of this Journal."

The "new results, obtained independently by several collaborators," were derived in experiments in which each observer followed Marshall's methods closely and with special care in all details, including stimulation of the flow of saliva by mastication of paraffin.² The results are appended in three separate reports (II-IV).

¹ A second supplement to the first section of the report, for 1915-'16, of findings in investigations conducted under the auspices of the First District Dental Society of the State of New York, and presented at the meeting of the Society, at the New York Academy of Medicine, November 6, 1916. The first section was published in the *Journal of the Allied Dental Societies*, 1916, xi, p. 659; the first supplement to the first section in *Ibid.*, 1917, xii, p. 65.

Previous papers, by the author, on Marshall's salivary factor, were published in the *Journal of the Allied Dental Societies*: (1) 1916, xi, p. 275 (June); (2) p. 488 (Sept.); (3) p. 659 (Dec.); (4) 1917, xii, p. 65 (March).

² Marshall. *American Journal of Physiology*, 1915, xxxvi, p. 260; *Ibid.*, 1916, xl, p. 1; *Dental Items of Interest*, 1916, xxxviii, p. 127; *Dental Cosmos*, 1916, lviii, p. 1225; *Ibid.*, 1917, lix, p. 33.

II

On the validity of Marshall's salivary factor for several men, women and children.³

By G. A. LOWENSTEIN

Specimens of saliva from fifteen people were examined. The essential data pertaining to the tests are recorded in Table I. Facts from the "histories" of these subjects, and summaries of the findings, are appended.

SUBJECT I. Man; age, 27. Two carious teeth were filled early during the progress of these tests. Before the conclusion of the tests seven additional "incipient cavities" were located by a dentist, which, he said, were due to faulty formation of the enamel at the points affected. The only salivary factors *above* 80 were obtained soon after the two larger cavities had been filled. *Salivary factor* (47) : all but 9 *below* 80.

SUBJECT II. Man; age, 26. One tooth carious. Saliva very viscid. *Salivary factor* (3) : all *below* 80.

SUBJECT III. Man; age, 26. One tooth carious; was filled during the progress of these tests. *Salivary factor* (5) : all *above* 80.

SUBJECT IV. Girl; age, 9. Three carious teeth. *Salivary factor* (2) : both *below* 80.

SUBJECT V. Boy; age, 11. Three carious teeth. *Salivary factor* (5) : all *below* 80.

SUBJECT VI. Woman; age, 23. Present immunity from caries. *Salivary factor* (2) : both *below* 80.

SUBJECT VII. Woman; age, 23. One tooth decayed. *Salivary factor* (1) : *below* 80.

SUBJECT VIII. Man; age, 40. Pyorrhea; no caries. *Salivary factor* (1) : *below* 80.

SUBJECT IX. Boy; age, 17. Present immunity from caries. *Salivary factor* (2) : one *below* 80, one *above* 80.

SUBJECT X. Man; age, 22. Three carious teeth. *Salivary factor* (2) : both *above* 80.

³ The author will present his results more in detail in a dissertation to be presented to Columbia University, in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

TABLE 1. DATA PERTAINING TO THE VALIDITY OF MARSHALL'S SALIVARY FACTOR, OBTAINED BY G. A. LOWENSTEIN
• Subject I

No. of test	Date	"Resting" saliva			"Activated" saliva			Salivary factor	Period of collection		Time when the last previous meal was eaten	Nature of the last previous meal	Remarks	
		Acidity: NaOH, n/200 sol.	Alkalinity: HCl, n/200 sol.	Total neutralizing power	Acidity: NaOH, n/200 sol.	Alkalinity: HCl, n/200 sol.	Total neutralizing power		"Resting" saliva	"Activated" saliva				
1	10/12	cc. 3.00	cc. 21.20	cc. 24.20	cc. 1.20	cc. 41.00	cc. 42.20	% 57.3	10:30-11:15	11:25-11:31	Eggs, bread, tea	{ Left saliva at room temp. for 24 hr.; new factor obtained was 83.	
2	10/13	3.40	25.20	28.60	1.00	42.40	43.40	65.9	12:00-12:50	.....	.....	" "
3	10/17	8.40	23.60	32.00	0.40	42.60	43.00	74.4	10:40-11:40	Salmon, vinegar, milk	{ 30 min. later a new factor was taken: 75.4.	
4	10/18	4.80	28.00	32.80	1.20	40.60	41.80	78.5	11:52-12:20	12:30-12:40	.....	" "	
5	10/19	5.80	22.60	28.40	1.00	36.00	37.00	76.8	10:12-11:12	11:15-11:27	9:10	" "		
6	10/20	6.00	22.40	28.40	1.20	35.60	36.80	77.2	9:45-10:25	10:50-11:15	.....	" "	
7	10/17													
7	1/10	3.35	25.01	28.36	Neutral	42.65	42.65	66.5	10:30-11:15	11:30-11:40	8:30	Eggs, bread, tea	{	
8	1/11	4.19	23.13	27.32	1.86	37.45	39.31	69.5	10:45-11:30	12:00-12:30	9:40	" "		
9	1/12	5.12	24.12	29.24	1.40	38.59	39.99	73.1	9:55-10:40	.....	8:30	Salmon, tea, vinegar	
10	1/13	3.72	26.26	29.98	1.86	36.57	38.43	78.0	10:40-11:00	11:40-11:48	9:20	Eggs, tea, bread		Compare with factor 11.1

11	1/13	4.65	26.63	31.28	11.30	43.10	54.40	57.5	2:15	3:15-3:20	1:30	Vegetable soup, bread, meat, coffee	{ Factors 10 and 11 were taken on the same day.
12	1/15	5.22	24.73	29.95	0.93	45.39	46.32	64.7	10:35-11:20	11:50-11:56	9:20	Eggs, tea, bread	{ Factors 12 and 13 were taken on the same day. ¹
13	1/15	4.80	25.50	30.30	2.24	36.92	39.16	77.4	1:15-1:47	1:47-1:53	12:40	Pea soup, roast beef, coffee, bread	{ Before collecting saliva, walked very rapidly about a mile. Factors 14 and 15 were taken on the same day. No. 14 soon after strenuous walk.
14	1/16	5.20	22.40	27.60	2.00	37.40	39.40	70.0	10:40-11:20	11:25-11:31	8:40	Eggs, bread, tea	{ Teeth cleaned by dentist. One cavity filled temporarily.
15	1/16	3.90	24.80	28.70	0.36	41.20	41.56	69.1	11:40-12:20	12:25-12:31	8:40	" "	{ Note the relatively low factor, taken before breakfast.
16	1/17	5.40	24.72	30.12	2.24	36.68	38.92	77.4	12:25-1:05	1:05-1:13	12:15	Sausage, wheat cakes, coffee	{ Two teeth were filled by dentist.
17	1/19	4.10	22.08	26.18	2.42	41.26	43.68	59.9	9:30-10:30	10:30-10:36	No breakfast	Eggs, tea, bread	{ Part of this saliva was allowed to stand at room temp. for 2 hr. and then titrated, when the factor was 62.6.
18	2/2	5.96	27.64	33.60	1.86	44.30	46.16	72.8	12:30-1:30	1:40-1:46	10:00	" "	{ Factors 23 and 24 were obtained on the same day, but for 24 the "resting" saliva was collected during a 45 min. run and the "activated" 10 minutes after the run.
19	2/5	10.42	20.52	30.94	3.72	40.08	43.80	70.6	2:20-3:20	3:20-3:26	1:30	" "	{ Note decrease in acidity and increase in alkalinity for 24. ²
20	2/6	5.96	20.98	26.94	2.60	37.92	40.52	66.5	10:00-10:40	10:50-10:57	9:00	" "	{ Factors 25 and 26 were taken on the same day. The "activated" saliva for 26 was collected during a 25 min. run; used the same "resting" saliva as for 25. Again there is increase in alkalinity and decrease in acidity (26). See 24. ²
21	2/7	5.40	24.00	29.40	2.60	41.30	43.90	67.0	10:20-11:10	11:40-12:00	9:00	" "	
22	2/9	5.96	23.80	29.76	2.04	40.66	42.70	69.7	11:35-12:50	12:50	9:30	Eggs, tea, bread	
23	2/10	5.58	22.74	28.32	1.86	36.94	38.80	73.0	10:55-11:55	11:45-12:05	10:00	" "	
24	2/10	3.34	29.74	33.08	0.74	40.38	41.12	80.4	12:00-12:45	1:00	.....	" "
25	2/12	4.93	23.34	28.27	2.42	38.92	41.34	68.4	10:50-11:40	.....	9:30	Eggs, tea, bread	
26	2/12	4.93	23.34	28.27	1.48	46.12	47.60	59.4	1:00	12:00-12:20	9:30	" "	

¹ Note the marked variability in the factor for Subject I. See especially factors 10 and 11, 12 and 13, and 42, 43 and 44, for specimens of saliva collected, respectively, on the same day. (compare also the data for Subjects V, IX and X.)

² These results are opposed to Marshall's theory on the effect of muscular contraction on salivary secretion.

TABLE 1. DATA PERTAINING TO THE VALIDITY OF MARSHALL'S SALIVARY FACTOR, OBTAINED BY G. A. LOWENSTEIN—Continued

No. of test	Date	"Resting" saliva				"Activated" saliva				Salivary factor	Period of collection		Time when the last previous meal was eaten	Nature of the last previous meal	Remarks
		Acidity: NaOH, n/200 sol.	Alkalinity: HCl, n/200 sol.	Total neutralizing power	Acidity: NaOH, n/200 sol.	Alkalinity: HCl, n/200 sol.	Total neutralizing power	"Resting" saliva	"Activated" saliva						
	1917	cc.	cc.	cc.	cc.	cc.	cc.	%							
27	2/15	5.39	25.69	31.08	1.86	43.62	45.48	68.3	10:00-11:00	1:00-1:10	8:30	Eggs, tea, bread			
28	2/16	8.00	22.8	30.80	1.58	35.56	37.14	82.9	9:20-10:20	10:25-10:35	8:20	" "			
29	2/19	7.44	32.43	39.87	2.79	41.54	44.33	89.9	3:45-4:30	4:30-4:40	2:00	Meat, apple pie, coffee, bread		Very soft stool.	
30	2/20	8.56	24.20	32.76	2.79	39.64	42.43	77.2	10:00-10:50	10:50-11:00	8:20	Eggs, tea, bread		Gastric indigestion.	
31	2/21	7.07	25.96	33.03	2.60	39.72	42.32	78.0	10:35-11:20	11:50-12:00	8:30	" "		"	
32	2/22	8.56	25.78	34.34	4.09	36.24	40.33	85.1	11:20-12:05	12:00-12:10	9:40	" "		"	
33	2/23	8.76	28.16	36.92	4.09	42.51	46.60	79.2	11:20-12:00	12:00-12:10	8:30	" "		"	
34	2/26	9.69	30.6	40.27	3.91	41.89	45.80	87.9	3:00-3:45	3:45-3:55	2:00	Pea soup, roast beef, apple pie		Very soft stool.	
35	2/27	7.44	23.37	30.81	2.97	40.36	43.33	71.1	12:00-12:40	1:45-2:00	8:30	Eggs, tea, bread		Stomach improved.	
36	2/28	7.44	25.38	32.82	2.98	40.77	43.75	75.0	10:50-11:40	....	9:10	Tea, sugar, cake			
37	3/2	7.07	18.04	25.11	3.16	38.20	41.36	60.7	10:40-11:30	11:45-11:55	8:30	Eggs, tea, bread		Stomach normal.	
38	3/7	8.93	27.07	36.00	1.00	39.00	40.00	90.0	2:25-3:10	3:15-3:25	1:45	Roast beef, vegetable soup, coffee, apple pie			

39	3/9	6.3	21.4	27.7	4.1	43.7	47.8	57.9	11:20-12:00	9:50-10:00	8:25	Tea, cake	{ "Activated" saliva collected before "resting."
40	3/22	3.2	27.4	30.6	2.4	41.2	43.6	70.2	11:00-11:30	11:40-11:50	....	....	{ Factors 40 and 41 taken on the same day. "Activated" saliva for 41 collected while walking.
41	3/22	3.2	27.4	30.6	2.4	44.5	46.9	65.2	11:00-11:30	1:20- 1:40	8:25	....
42	3/27	11.5	21.7	33.2	5.2	36.4	41.6	79.8	9:35-10:30	10:50-11:00	8:30	Eggs, tea, bread, butter	
43	3/27	8.0	28.4	36.4	3.1	37.4	40.5	89.8	2:15- 2:50	3:00- 3:10	1:30	Roast beef, apple pie	{ Factors 42, 43 and 44 were taken on the same day.
44	3/27	7.4	34.3	41.7	2.8	39.1	41.9	99.5	4:20- 4:50	5:00- 5:10	1 30	" "	
45	3/28	7.2	23.6	30.8	3.6	37.3	40.9	75.3	10:50-11:20	11:25-11:40	9:00	Eggs, tea, bread, butter	
46	3/28	8.4	25.5	33.9	3.4	38.7	42.1	80.5	2:00- 2:40	3:00- 3:15	12:30	....	{ Factors 45, 46 and 47 were taken on the same day.
47	3/28	6.2	21.5	27.7	3.6	33.6	37.2	74.5	3:50- 4:30	4:45- 5:00	12:30	....

Subject II

48	1/11	8.20	22.08	30.28	Alk.	62.24	62.24	48.6	12:00	....	....	....	{ One carious tooth.
49	1/17	8.56	18.40	26.96	"	63.72	63.72	42.3	1:00- 1:50	1:57- 2:07	12:45	Steak, pie, coffee	
50	1/18	6.88	27.76	34.64	0.38	64.50	64.88	53.4	3:00- 4:00	4:00- 4:10	12:30	Roast beef, coffee	

Subject III

51	1/26	9.48	27.10	36.58	3.72	36.54	40.26	90.8	11:00-12:00	12:00-12:20	9:00	....	{ One carious tooth.
52	1/31	7.44	26.36	33.80	3.54	35.86	39.40	85.8	....	....	10:00	....
53	3/21	11.2	37.00	48.20	4.30	41.40	45.70	105.4	....	....	....	....
54	3/22	11.6	31.20	42.80	4.30	35.30	39.60	108.1	11:00-12:00	12:30-12:50	....	....	{ Mouth "immune" now, after cavity was filled. ³
55	4/4	11.5	32.80	44.30	6.90	36.40	43.30	102.3	....	....	....	....

³ Note the larger numerical values, for the factor, for saliva obtained after the teeth had been cleaned and polished, and the cavity filled.

TABLE 1. DATA PERTAINING TO THE VALIDITY OF MARSHALL'S SALIVARY FACTOR, OBTAINED BY G. A. LOWENSTEIN—Continued

No. of test	"Resting" saliva			"Activated" saliva			Salivary factor	Period of collection		Time when the last previous meal was eaten	Nature of the last previous meal	R marks
	Activity: NaOH, n/200 sol.	Alkalinity: HCl, n/200 sol.	Total neutralizing power	Activity: NaOH, n/200 sol.	Alkalinity: HCl, n/200 sol.	Total neutralizing power		"Resting" saliva	"Activated" saliva			
Subject IV												
56	1/20	5.40	24.32	29.72	2.42	38.04	40.46	73.5	10:05-11:00	11:00-11:20	Coffee, cake	Three carious teeth; large cavities.
57	2/3	9.30	23.56	32.86	5.22	46.24	51.46	63.9	10:30-11:30	11:30-11:50	Orange, chocolate	
Subject V												
58	2/10	7.44	13.64	21.08	2.42	38.70	41.12	51.3	11:10-12:00	12:00-12:15	Rolls, coffee	Three carious teeth; two of the cavities are very large and deep. Factors 58 and 59 were obtained for specimens of saliva secreted on the same day, "resting" saliva for factor 59 having been collected during a 30-minute run by the subject; note the increase in alkalinity and the decrease in acidity. ⁴
59	2/10	6.52	22.16	28.68	0.56	38.34	38.90	73.7	12:15-1:00	1:00-1:15	....
60	2/12	7.60	15.20	22.80	1.86	35.50	37.36	61.0	10:10-11:40	11:40-12:00	....
61	2/13	4.09	17.31	21.40	1.86	40.78	42.64	50.2	3:30-4:30	4:30-4:50	Soup, coffee	
62	2/14	4.28	22.64	26.92	1.68	41.94	43.62	61.7	3:30-4:30	4:35-4:55	....
Subject VI												
63	1/31	3.72	18.40	22.12	2.42	50.48	52.90	41.8	....	....	....	Immunity with care.
64	3/22	4.30	21.00	25.30	4.10	39.90	44.00	57.5	10:30-11:20	11:30-11:40	Meat, fruit, water	
Subject VII												
65	1/19	10.78	20.36	31.14	3.34	52.98	56.32	55.3	10:50-12:30	12:40	Milk, apple, cream	One carious tooth.

Subject VIII

66	1/10	1.00	25.80	26.80	3.0	51.20	51.20	52.3	1.00	9:00	Coffee, cake	Pyorrhea; no caries.
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Subject IX

67	2/12	5.58	19.30	24.88	3.34	26.66	30.00	82.9	10:45-11:35	11:40-12:00	Immunity with care.
68	2/17	4.09	21.24	25.33	1.30	35.91	37.21	68.1	3:30-4:20	4:30-4:50	3:00	

Subject X

69	2/3	10.60	12.06	22.66	2.05	23.43	25.48	88.9	1:40-2:40	2:50-3:00	12:00	Three carious teeth (large cavities).
70	2/10	4.46	18.63	23.09	1.00	21.18	22.18	108.6	2:00-2:50	12:30	Meat, tea, bread	

Subject XI

71	3/10	11.54	27.32	38.86	2.60	60.46	63.06	61.6	4:00-4:40	4:50-5:00	1:30	Eight large cavities.
72	3/17	9.40	26.60	36.00	2.40	56.00	58.40	61.6	4:00-4:45	5:00-5:15	1:30	Meat, apple, coffee, bread	

Subject XII

73	4/1	15.0	20.6	35.6	3.4	36.6	40.0	89.0	10:00-10:50	11:00-11:15	8:00	Coffee, rolls	Three large cavities.
74	4/7	14.5	16.5	31.0	4.8	38.8	43.6	71.1	

Subject XIII

75	3/28	8.40	22.80	31.2	3.0	44.7	47.7	65.4	10:20-11:00	11:00-10:15	7:30	Coffee, cake	Absolute immunity without care.
76	4/3	6.6	31.7	38.3	2.8	53.1	55.9	68.5	3:30-4:20	4:30-4:50	.....	.....
77	.....	8.2	31.0	39.2	3.9	48.2	52.1	75.2	.....	.....	.....	.....

Subject XIV

78	3/10	7.0	29.4	36.4	3.2	33.0	36.2	100.6	Two cavities.
79	3/18	11.9	23.7	35.6	1.5	34.1	35.6	100.0	

Subject XV

80	3/17	12.6	23.4	36.0	5.0	41.0	46.00	78.3	One cavity.
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* These results are opposed to Marshall's theory on the effect of muscular contraction on salivary secretion.

SUBJECT XI. Man; age, 20. Eight carious teeth. *Salivary factor* (2): both *below* 80.

SUBJECT XII. Boy; age, 18. Three carious teeth. *Salivary factor* (2): one *above* 80, one *below* 80.

SUBJECT XIII. Man; age, 23. Immunity without care. *Salivary factor* (3): all *below* 80.

SUBJECT XIV. Man; age, 28. Two carious teeth. *Salivary factor* (2): both *above* 80.

SUBJECT XV. Man; age, 26. One carious tooth. *Salivary factor* (1): *below* 80.

Marshall claims that a salivary factor *below* 80 indicates present immunity from dental caries, and that one *above* 80 indicates present susceptibility to caries. If this claim by Marshall were justified, the factors for 11 of these 15 subjects, as determined by the very obvious clinical facts in each case, would have been uniformly *above* 80; but for 7 of these 11 subjects the factors were usually, if not always, *below* 80. The factors for 4

TABLE 2. DATA PERTAINING TO THE VALIDITY OF MARSHALL'S SALIVARY FACTOR AS APPLIED TO THE FIFTEEN SUBJECTS EXAMINED BY
G. A. LOWENSTEIN

Subject No.	Dental condition determined clinically at least once during the period of salivary examination.	Salivary factor	
		Plus sign signifies: usually above 80. Minus sign signifies: usually below 80.	
		Found	Should have been, according to Marshall
I	Caries	—	+
II	"	—	+
III	"	+	+
IV	"	—	+
V	"	—	+
VI	Immunity	—	—
VII	Caries	—	+
VIII	Immunity	—	—
IX	"	± ¹	—
X	Caries	+	+
XI	"	—	+
XII	"	± ¹	+
XIII	Immunity	—	—
XIV	Caries	+	+
XV	"	—	+

¹ Two determinations, one above 80, one below 80.

of the subjects (if Marshall's diagnostic claims were well founded) should have been uniformly *below* 80. For 3 of these 4 subjects all the factors *were* below 80.

For only 6 of the 15 subjects was there agreement between the factors found and those required by Marshall's theory, as may be seen at a glance in Table 2.

These results show unmistakably that Marshall's salivary factor is not an index of immunity from, or susceptibility to, dental caries.

III

On the validity of Marshall's salivary factor in the case of a young woman whose saliva was examined almost daily during a period of one month.

By HATTIE L. HEFT

The results of this test are recorded in Table 3. Direct dental examinations on or about December 1, 1916, and again on February 21, 1917, established the fact that the subject of this experiment was entirely free from caries throughout the period of observation. This subject's saliva was usually "thin and watery," and flowed abundantly with or without stimulation.

According to Marshall's theory, the salivary factors for this woman should have been invariably *below* 80. Such was the case. For this subject there was perfect agreement between the findings and the requirements of Marshall's theory.

The striking features in the reaction of the specimens of saliva from this subject were great increase in alkalinity and marked decrease in acidity, *after stimulation*, in every instance.

IV

On the validity of Marshall's salivary factor for an American woman and a Japanese man.

By LEILA NOLAND

The results of these tests are summarized in Table 4. Facts from the "histories" of these subjects are appended.

SUBJECT A. American woman; age, 26. There was one

small cavity in each of three teeth on February 15, 1917. The last previous dental treatment, including fillings inserted, was effected on or about October 1, 1916.

SUBJECT B. Japanese man; age, 26. There was one small cavity in each of two teeth, February 24, 1917. The last previous dental treatment was completed about a year prior to that date.

The findings for these two subjects do not agree with the requirements of Marshall's theory—the salivary factors should have been *above* 80, but all were *below* 80.

V

General conclusions.

There was agreement between the salivary factors "found" by Mr. Lowenstein, and those required by Marshall's theory, for only 6 of 15 subjects. There were 47 tests of saliva from Subject I, but only 9 of the 47 specimens gave factors in accord with Marshall's diagnostic claim (II).

Tests by Miss Heft, of 24 specimens of saliva from one subject, gave results in complete harmony with Marshall's theory (III).

Each of two subjects, in the tests by Miss Noland, secreted saliva that failed, in every instance, to yield salivary factors in accord with the indications of direct clinical examinations of the teeth (IV).

These results, obtained *wholly independently* by each collaborator, on saliva secreted by "paraffin stimulation" (as required by Marshall), fully confirm the findings originally reported by Shepard and Gies,³ to the effect that Marshall's salivary factor is not an index of the presence or absence of dental caries.

The senior author has refrained from presenting additional data of his own, though they fully support his criticisms of Marshall's claims (see footnote 1) and show that the salivary factor is devoid of the diagnostic significance ascribed to it by Marshall.

We are greatly indebted to Dr. Wm. B. Dunning for very helpful coöperation in some of the clinical phases of these tests.

³ Shepard and Gies: *Journal of the Allied Dental Societies*, 1916, x1, p. 275.

TABLE 3. DATA PERTAINING TO THE VALIDITY OF MARSHALL'S SALIVARY FACTOR, OBTAINED BY HATTIE L. HEFT

Test		"Resting" saliva			"Activated"			Salivary factor %
No.	Date 1917	Alkalinity: HCl, n/200 sol. cc.	Acidity: NaOH, n/200 sol. cc.	Total neutralizing power cc.	Alkalinity: HCl, n/200 sol. cc.	Acidity: NaOH, n/200 sol. cc.	Total neutralizing power cc.	
1	1/24	12.9	9.22	22.12	42.3	1.46	43.76	50.55
2	1/25	13.15	7.48	20.63	44.66	-1.50	44.66	46.19
3	1/26	15.58	6.12	21.70	52.14	1.07	53.21	40.78
4	1/27	15.28	7.38	22.66	48.90	1.45	50.35	45.00
5	1/29	18.80	5.7	24.50	44.80	1.55	46.35	52.86
6	1/30	18.2	5.1	23.30	51.50	0.70	52.20	44.63
7	1/31	16.80	3.6	20.4	46.80	-1.50	46.80	43.59
8	2/1	18.7	2.8	21.5	42.0	1.4	43.4	49.54
9	2/5	13.0	11.0	24.0	42.0	1.4	43.4	55.30
10	2/6	14.5	7.2	21.7	42.0	1.9	43.9	49.43
11	2/7	15.6	6.6	22.2	55.5	-0.7	55.5	40.00
12	2/8	14.8	9.2	24.0	53.6	-2.0	53.6	44.78
13	2/9	16.0	7.1	23.1	55.0	2.0	57.0	40.53
14	2/12	16.5	8.5	25.0	57.0	-1.6	57.0	43.86
15	2/13	16.5	8.2	24.7	46.4	1.7	48.1	51.35
16	2/14	15.5	8.7	24.2	46.6	1.5	48.1	50.31
17	2/15	17.2	6.1	23.3	56.0	1.2	57.2	40.73
18	2/17	17.0	8.0	25.0	47.0	2.8	49.8	50.20
19	2/19	15.5	9.8	25.3	46.5	1.1	47.6	53.15
20	2/20	17.8	7.0	24.8	49.1	1.0	50.1	49.50
21	2/21	15.5	8.7	24.2	46.6	1.5	48.1	50.31
22	2/22	16.2	6.7	22.9	47.0	1.6	48.6	47.12
23	2/23	18.0	5.8	23.8	49.5	1.7	51.2	46.48
24	2/26	12.5	11.4	23.9	43.0	1.3	44.3	53.95

TABLE 4. DATA PERTAINING TO THE VALIDITY OF MARSHALL'S SALIVARY FACTOR, OBTAINED BY LEILA NOLAND

Date 1917	"Resting" saliva			"Activated" saliva			Salivary factor
	Alkalinity: HCl. n/200 sol,	Acidity: NaOH. n/200 sol,	Total neu- tralizing power	Alkalinity: HCl. n/200 sol,	Acidity: NaOH. n/200 sol,	Total neu- tralizing power	
	cc,	cc,	cc,	cc,	cc,	cc,	
Subject A (American woman)							
1/26	18.2	4.3	22.5	39.2	0.9	40.1	56.11
2/5	12.4	4.0	16.4	22.5	0.7	23.2	70.69
2/7	10.0	2.2	12.2	15.7	1.0	16.7	73.05
2/9	9.6	2.7	12.3	17.0	1.2	18.2	67.58
2/10	8.7	2.3	11.0	13.2	1.2	14.4	76.39
3/7	8.8	2.3	11.1	17.0	2.2	19.2	57.81
Subject B (Japanese man)							
1/23	14.5	5.7	20.2	36.1	2.2	38.3	52.74
1/24	13.2	5.8	19.0	29.85	4.0	33.85	56.13
2/2	12.0	3.1	15.1	21.6	1.0	22.6	66.81
2/7	13.0	3.1	16.1	21.8	0.8	22.6	71.24
4/10	12.1	2.0	14.1	17.8	0.7	18.5	76.20

MOTION STUDY IN DENTISTRY¹

BY FRANK B. GILBRETH

Mem.Amer.Soc.M.E., Member Franklin Institute.

Past Vice-President of the Society for the Promotion of Engineering Education.

THE fact that you are considering the subject of Motion Study in Dentistry at this meeting indicates, not only that the world has come to see the importance of the profession of Dentistry, but that you, as a profession, have come to see the importance of your own work. When any profession, trade or other line of activity comes to consider Motion Study as applied to itself, this indicates that those engaged in the work realize the necessity of intensive self study, if improvements made are to be radical, widespread and of permanent value.

The world is only gradually coming to realize the importance of dentistry to health. At a time not very recent, good teeth were largely a matter of pride and of attractive appearance. To-day sound healthy teeth are realized to be an indication of general well being, and putting the teeth into this desirable condition is understood to be a profession that deals with the conservation of the health, working-power and happiness of the race.

Along with the realization of the relationship between the teeth, the eye, the ear, the throat, the stomach and other parts of the body, has come the recognition of the relationship between the work of those who keep these various parts of the body in condition, between the dentist, the oculist, the aurist, the other specialists in various lines, the general practitioner and the surgeon. There is a wider relationship, however, that must be recognized before the dentist can utilize to the full the opportunities that lie before him. This is the relationship between all kinds and types of activity. The dentist is a professional man. He is also, as is the surgeon, a mechanic. A large part of his work has to do with the successful handling of his own muscular equipment, and "technical skill" is only another way of describ-

¹ Presented at the Massachusetts Dental Society, Springfield, May 1917.

ing ability to recognize one's body as a machine and to use this machine in the most efficient way possible.

Those of us who have advocated this view for years against strenuous opposition were not surprised to hear the objections of untrained workers in the industries who felt that comparison to a machine was belittling, but it has been an enormous surprise to find men of education, training and experience in the professions who resent, deeply, and sometimes hotly, being compared not only to machines, but to mechanics in the industries which deal with machines, with tools and with industrial processes.

With the writing of "*Le Moteur Humain*," by Amar, and the great work that that French scientist has contributed to the physiological side of activity, this opposition is gradually decreasing, but there is yet time for dentistry to register itself as a pioneer profession, to claim a standing among mechanics, and to demand a knowledge of the laws of mechanical efficiency and a practice that conforms with these.

Your program for this meeting shows the realization of this fact, for you are discussing the dentist as a mechanic as well as a professional man, a psychologist and a business man. I take your invitation to me to speak here as an indication that you realize also the need for recognition in your profession of the fundamental principles of efficiency, and of the benefits of coöperation between all those interested in these principles and their application in all lines of activity.

Efficiency has been well defined as "finding out what you want to do, and then doing it in the best and cheapest way." This definition is adequate, if the various terms are interpreted as they should be. "Finding out what you want to do," must be a process, not of guess work or even of reasoning, but of accurate measurement. The "best way" must be the way that conforms most nearly to the requirements in quantity and quality. The "cheapest way" must be the cheapest, not only in money, but also in effort and in fatigue. In the industries we phrase it sometimes as "securing maximum output of a desired quality with minimum expenditure of cost and effort." But however you define efficiency, you must mean by it obtaining the desired

end with the greatest amount of satisfaction to all concerned.

The problems of efficiency may be attacked by various methods. We prefer to attack them through the methods of Motion Study. Results are obtained through activity of some sort, physical, mental, or both. Progressive psychologists say that there is no mental activity without some physical manifestation, and no physical activity without a mental accompaniment. However we may believe on this score, activity of some sort must take place if results are to be obtained.

Motion Study consists of considering this activity from the *motion* standpoint. We divide our study into three parts, and consider:—first, variables of the worker; second, variables of the surroundings, equipment and tools; and third, variables of the motion itself.

I shall not attempt to discuss the different variables coming under these headings, either in the vocabulary of the industries, where their use originated, or in the vocabulary of dentistry. The first would strike you as so technical as to be uninteresting, the second as so non-technical as to be absurd. I shall merely attempt to outline the method of attack, leaving you to fill in the details in your own vocabularies.

In the study of the variables of the worker we include, as far as possible, a review of all characteristics, both those acquired through heredity and through education or environment. In the industries, our studies of work and workers proceed simultaneously, and we are gradually becoming more and more able to state which type of worker is best fitted for any particular type of work. It may interest you to know that in the final analysis, however, we believe that man or woman is best fitted for any particular work who has the greatest desire for that kind of work. The study of the worker, has two parts. First, how well does any particular worker fit the job at which he is placed, and second, what type of work would be the ideal type for that particular worker. Men in the professions are usually more fortunate than men in the industries, in that they come into their life work more through choice than through chance, circumstances, or pressure. Many workers in the industries are at their occupations because poverty or lack of opportunity has

forced them to take up the work, and lack of chances for advancement has forced them to keep at it. The professional man may be forced to keep in the profession he has chosen by some such pressure, even though he later find the work distasteful to him, but his first choice, at least, is usually made according to his inclination, desire or ambition. You must, if you intend to place the worker in your line according to measurement, have some very definite idea as to what the profession and the subdivisions of the profession require of the workers in it, and as to the ideal type to do the work.

This naturally leads to the question of functionalizing the work. As you know, the opposition to functionalization is very old. On the other hand, the advocates of specialization and functionalization go back prior to the days of Adam Smith who wrote most clearly on this subject in 1776 in the "Wealth of Nations." In these days, it is becoming more and more clearly recognized that any sort of work requires so much information and so much training that only a narrow field can be covered intensively. Specialization must inevitably result.

The objections to specialization and functionalization have come, naturally enough, largely from those who lack training and experience and who are not experts in any one line. To them specialization seems extremely narrowing. It is not necessary, before an audience like this, to explain that nothing is so broadening as a specialty adequately covered, and that nothing is more interesting and less monotonous. If the dental profession can be enrolled among the exponents of efficiency, it can do a great work in preaching this doctrine to workers in all lines.

Yet we have found unexpected opposition to functionalizing the work on the part of the dental profession. You can readily see, however, that the more the work is functionalized, the greater number of types can find adequate opportunities for development. It must be understood that functionalization is primarily a method for attaining greater efficiency by assigning to each worker that work that utilizes his high priced motions only, by allowing him to work the greatest number of working minutes possible at the highest type of work of which he is capable. The product of such functionalization is greater effi-

ciency and a larger amount of high quality work. The by-product of it is greater satisfaction to the worker himself, who is relieved of all his less productive work and allowed to specialize on that which he does best and that interests him the most.

I am hoping to hear in the discussions, some description of the present state of functionalization in the profession of Dentistry, covering the ideals for which you strive, the existing conditions, the tendencies and prophesied results.

We turn now to the variables of the surroundings, equipment and tools. When the worker has been selected to the best of our knowledge, we attempt in every way possible to adapt the surroundings, equipment and tools to his particular needs. It goes without saying that in your profession the presence of the patient as a constant factor in some ways complicates, and in some ways simplifies the problem. The problem is simplified in that it is necessary that the surroundings be attractive, that there be good light, proper heat and ventilation and the other requirements for comfortable living. This is not always, unfortunately, the case in the industries, where the worker has no such choice as to remaining as has the patient. A dentist's office is an interesting place. It combines, in some respects the problems of the hospital, the factory and the office, and we hope that it may also take over, in time, some of the functions of the school or other educational institution as well. The dentist's office might well be made a model of efficiency, which all these other lines of activity might be glad to follow. From the nature of the case, a large part of the majority of dentists' offices and work places are opened to the constant inspection of the dentist himself, his assistant or attendant, visiting salesmen and patients.

In all departments, the primary requirement for the surroundings, equipment and tools is *Measurement*, and as a result of this, *Standardization*. When I say measurement, I mean recording what exists by the most accurate means possible, discovering the reasons why it exists, and then making changes along the lines that the measurements themselves indicate as most necessary. Our method of making such measurements is as follows:—We begin always, where this is possible, with a survey. Such a survey may consist of a written description, supplemented

by drawings, photographs, sketches or any other devices possible for recording what exists and what is taking place. The great difficulty in making such a survey is to set down honestly and accurately exactly what does exist. There is an enormous temptation, especially if the survey is made by someone interested, to set down instead, what ought to exist, what it is hoped will exist, what it is planned should exist, or anything but what is actually there. Try it for yourself. When you return to your office next week, set down or have someone who can give the time set down exactly what happens in your office during one typical half-hour. Add to this drawings showing the "setup" or "layout" of your work, where each piece of working equipment is placed, etc. We have found it very satisfactory, where plans exist, to use these as a basis, and to draw in the other small objects. Believe me, there is nothing that will prove so interesting or so stimulating to you as an attempt to make a survey of your own working conditions and your own practice and then to review this intensively.

When existing conditions have been recorded as carefully as possible, it is then our practice to cross section everything on which we can lay our hands. We do this by putting a set of lines parallel to one another four inches apart all over every working surface and a second set similarly spaced horizontal to these, so that, at the finish, every bit of wall, floor, desks and work place, is cross-sectioned and ready for more accurate records. Where we have the decision, the cross-sectioning is made permanent. I regret to say, however, that some clients have put the cross-sectioning on with paint that can easily be removed, and have very quickly erased it after the first records were taken, either because they thought that it was "inartistic," or because they were not particularly flattered by the results that the record showed. But I have already said that this work takes courage.

Besides cross-sectioning the work place, we take pictures of it with the cross-sectioned screen. I shall not burden you with the description of this here, as we have already described it, and the matter is in print.² It is possible with this method to get

² See "Applied Motion Study"—Sturgis & Walton, 31 East 27th Street, New York City.

very accurate records, since we are able to introduce a cross-sectioned screen in the picture at any angle, and thus, by taking stereoscopic pictures, to record measure and activities in three dimensions. Having introduced the cross-sectioning element into our work place in some way, it is now possible, by experimenting, to find exactly those places in which the equipment and tools can be best placed. By "tools," of course, in your case I mean instruments. We have found some users of instruments highly disgusted at having their "instruments" classed with tools. You, however, are I feel sure, broad enough to consider the term "tools" in its wide sense, and to appreciate its use.

Speaking of tools, or instruments, leads me to emphasize the fact that superskill with a few tools is more to be desired than a moderate amount of skill with each of many tools. You know better than I do the number of tools that exist in your profession, the state of standardization of dental instruments, the amount of difference between these different types and sub-types of instruments, and the great need for standardization.

When you have a thorough realization of how your equipment and tools are placed, and of the conditions of your surroundings, you are ready to make intensive motion studies, that is, to consider the variables of the motion itself. In order to make accurate motion studies, and such as will have permanent value, some amount of equipment is necessary. We make our studies largely through the micromotion method and the chronocyclegraph method, that is, by using the cinematograph and a specially devised time-piece for the micromotion method, along with the usual cross-sectioned background and penetrating screen. For the chronocyclegraph method, we use lights, flashing at controlled uniform intervals, attached to the various moving parts. But such equipment as this is not necessary for preliminary motion study. In fact, in order thoroughly to realize the need of the more accurate measurement, it is necessary to do considerable thinking along lines of motion economy, and some work without any equipment.

You must realize, however, from the outset, that *Fatigue Study* is a necessary complement to *Motion Study*,³ and that the

³ See "*Fatigue Study*"—Sturgis & Walton.

fatigue which is the outcome of the motion must never for a moment be forgotten. For example, a long motion may occupy no more time than a short motion, but the fatigue will be greater with the amount of distance traversed, all other things remaining the same. Because of the nature of your work, you dentists must have made many observations of fatigue, both in yourselves and in your patients. You, therefore, make excellent subjects for the fatigue study that accompanies motion study. This being the case, it is surprising how few among your number work seated, and what a comparatively few of your number use fatigue eliminating devices. Fatigue elimination for the patient has been thoroughly, if not always scientifically, considered. Fatigue elimination for the dentist is as yet negligible. We have often wondered what the psychology of this is. In attempting to introduce seats for the saleswomen in the Department Stores, we have been informed by managers that customers dislike being waited upon by seated saleswomen. Can it be possible that patients dislike, or disapprove of, being operated upon by seated dentists? If so, there is work in education to be done here!

Motion economy also involves a consideration of delays, the reasons why they occur and a reconstruction of the method to such an extent that avoidable delays are eliminated, and that unavoidable delays are made rest periods or otherwise utilized in some way. With this will come not only a better *placing* of materials, but a better *routing* of materials. One caution is necessary here. Before making changes, consider every element of the problem, or you will find that your work must be undone and redone a great many times. In the industries, and also in other work, we gain much assistance by the use of route models, which are small working models showing where the different sorts of material and equipment are placed, and the paths by which they move. The materials and equipment are represented by small pieces of cardboard, the paths by path strings. The advantage of this is that planning of changes is separated from performing. It is also possible to show temporary changes by the use of different colors and to test these temporary changes before any are made permanent.

Now, what are the results of this Motion Study? As made

by you in your own office, with little time at your disposal and no equipment for accurate measurement, the changes that you make may have no startling value in themselves, although, gradually, a permanent improvement should be apparent. The great and important result of the motion study will be the change in your own mental attitude. No one can really appreciate the benefit of motion economy who has not made motion study himself in his own work place, upon his own work. To begin with, you will see your work place, yourself and all that you do in a new light. Even so expert an orthodontist as Dr. Jane G. Bunker, of New York, who has coöperated with us in making Motion Studies of Dentistry, was surprised at the records of the paths of her motions. In the second place, everything you do, no matter how trivial, will become intensely interesting. Thirdly, all activity, outside of and away from work, will have more significance. In the fourth place, and perhaps most important of all, you will increasingly see each day the underlying element of *likeness* in all types of activity. Just as there are physical elements, so there are elements of skill. You will come to distinguish skill, from mediocre activity, and from bungling activity and to note that an expert in any line bears certain resemblances to experts in other lines. Motions of experts in all activities are alike. All are smooth; all are graceful; all show decision without hesitation and all produce that satisfaction in the beholder that they produced in the creator of the motion.

The great benefit of Motion Study is, then, education. In the case of the dentist, this education should be passed on. First, by the pioneers who make it, to the rest of the profession, who can progress faster and with less difficulty when the methods are presented to them in their own vocabulary.

Next perhaps to the patient. I would suggest that you add to the discussion of Dr. Anderson's paper on "Winning and Holding the Confidence of the Patient," a discussion of "Educating the Patient." From some of the talks that we have had at various times with dentists we believe that there is much need for this education. If it is true that the average patient refuses to have the work functionalized, that he will not allow some less specialized practitioner to do cleaning of his teeth or some other

simple operations that could as well be done by younger or less trained dentists, there is surely room for education here.

The patient also requires much more education in home care of his teeth. The results obtained with adults, and especially with children, by careful instruction as to daily home care of the teeth are astonishing to those not acquainted with them. It is scarcely necessary to say that those trained in this way make, in the long run, better patients than those less carefully trained, since they are more anxious to have expert work, when such is necessary, than is the untrained patient. We are hoping also to have the coöperation of the dentist in educating the patient and through him, the public, as to the need of the Dental Nurse, since this will not only mean better teeth for the community but a new, necessary and remunerative opportunity of earning a livelihood for the crippled soldier. Our outline for work along this line is already being put in print, so I shall not burden you with a further discussion of this point here, especially as Dr. Frank L. Marshall, one of your own members, has coöperated with us in this work, and can present it to you better than I can.

A third class whom the dentist is to educate consists, of the young men and women coming up, who will enter the profession. It is to be hoped that your motion study will lead you to advocate the result of our findings, which are that efficiency consists of using the very best motions only. I am grieved to see on your cover a motto including the phrase "To learn *every* method." Now to learn *every* method of doing work may be an admirable thing for the critic of methods. It certainly is nothing for the man who wishes to be an expert in any one method, at least it is nothing for a learner. Fast motions are different from slow motions. They occupy different paths, they utilize different muscle tensions. Right motions are different from wrong motions. If you allow the learner to experiment with, and to learn, many wrong or inefficient methods at first, these will cause constant habit interferences when he does learn the right and most efficient methods. This you will come to believe, and it will then become your duty to teach it, to see that in the schools and in the colleges the right method, consisting of the right motions, is taught first and is insisted upon until its

use becomes a habit. You also must realize, as do other bodies in the community, the need of early and constant training in what we call "finger wisdom," the need for exercise of and for acquiring skill in the muscles. This training should begin very early in the child's life, should be carefully continued throughout school, college and later technical training, if we are to have really skilled mechanics in our trades and our professions. This you must know, and it is your duty to stand for this ideal before the community.

It has been my endeavor to show you not only the need for motion study in your particular profession, and the opportunities for it, but also the demand that is made upon you, as a profession, to go into this work, for the good of the community in general, as well as for your own good. We have talked much about "Preparedness;" you yourself have thought much along this line. The time has now come for action. This country needs more than anything else a body of citizens trained to do the things that they know how to do, and that they like to do, in the best method possible. It is your duty to aid in this work not only individually, but as a body—to standardize the work of your profession, the tools and equipment by which the work is done, and the type of people who are permitted to do it; to put your results into working form, and put them at the disposal of your brothers in the profession, and of the world in general. This is nothing that can wait for the next generation, or even the next year. The world is waiting for it, and it must be done NOW.

THE NEW DEAN OF TUFTS COLLEGE DENTAL SCHOOL

THE complimentary dinner given on March 31, at the Hotel Vendome, Boston, to Dr. William Rice, Dean elect of the Tufts College Dental School, is more than locally interesting. It has a definite relation to dental education and possesses, therefore, a professional significance. The dinner was a marked success in numbers, enthusiasm and in even more than the usual accessories which make these occasions pass happily. More than a hundred ladies were present, a portion of them dentists but the larger number wives and friends of dentists. American flags adorned each table and a spirit of patriotism was in the air. Songs were sung in chorus in addition to a special musical program by orchestra and soloists. When the Marseillaise was struck up every one rose and joined in singing it.

The after dinner speaking was unusually good; it possessed the qualities one expects to find mingled on such an occasion; it was varied, pertinent, humorous, reminiscent and at times finely serious and inspiring. In one particular it was unique in the experience of most of those present, in that one of the toasts was to a woman. Dr. Charles M. Proctor of Boston was toastmaster. Before the regular speaking Professor George A. Bates of the Tufts Dental School very gracefully presented to Mrs. Rice, wife of the Dean elect, a bouquet of roses. The following is a list of speakers and toasts: Herman C. Bumpus, Ph.D., Sc.D., LL.D., President of Tufts College, "The Dental School"; Charles F. Painter, A.B., M.D., Dean of the Tufts Medical School, "Our Dental School in the Past"; Eugene H. Smith, D.M.D., Dean of Harvard Dental School, "The Obligations of a Dental Dean"; Leila M. Taylor, D.M.D., of Salem, Mass., "Women of the Alumni"; Frank A. Delabarre, A.B., D.D.S., M.D., Professor of Orthodontia at The Forsyth Infirmary and in Tufts Dental School, "Tufts' Opportunity"; Robert R. Andrews, D.D.S., A.M., Member of the Board of Trustees of Tufts College, "Reminiscences of the Boston Dental College"; William

Rice, D.M.D., Dean elect and Professor of Operative Dentistry in Tufts Dental School, "The Future of Tufts College Dental School."

Dr. Andrews, the veteran of the occasion, gave interesting reminiscences of the Boston Dental College of which institution he was an early graduate as also at a later period were Drs. Rice, Bates and a large number of the dentists present, the merging of the Boston Dental College in Tufts College having been brought about seventeen years ago. Dr. Rice in responding to the last toast, after appreciative reference to those who had been active in the movement for a dental dean and in his appointment, dwelt upon the spirit of loyalty as typified in the national emblem, the flag, and the necessity of loyalty to the Dental School on the part of every alumnus. In closing, with deep feeling and language of unusual impressiveness, he dedicated himself to the service of the school.

Dr. Rice is the first dental dean of the Tufts College Dental School, but the Boston Dental College was served by a dentist in this capacity for a brief period; otherwise the deans have all been physicians.

The movement for a dental dean was started five years ago by the appointment in a regular meeting of the Alumni Association of the Dental School of a committee instructed to work to this end. The committee after presenting its petition as expressive of the wishes of the alumni, was assured that a dental dean would be appointed. The selection of Dr. Rice for the position is the fruition of this promise. Dr. Rice's selection seems especially fortunate. His high character, his standing as a dentist, his long association with the Dental School, his valued membership in dental organizations of the city and state, his ever ready help in progressive movements, his high professional ideals and his proved ability in organization all emphasize the fitness of his elevation to this important position.

Among the causes which have given strength to the movement for a dental dean beyond the general advantage of dental supervision are the large increase in the enrollment of the Dental School, the addition of a fourth year to the curriculum with the charges involved therein, the advance in the ideals and practice

of the dental profession at large and the need of bringing the instruction and practice in a dental school infirmary on a level with the methods of modern surgery, and the advantage of such participation in the larger discussions relative to dental schools and dental school instruction as would be possible only to a dentist.

Dr. Rice was born in Dublin, N. H., in 1867. His early education was acquired in the common schools of his native town. Later, he attended the high schools at Milford, N. H., and Beverly, Mass. His dental training was obtained at the Boston Dental College, from which he was graduated in 1888. Since that time he has been a member of the instructing staff almost continuously. In 1899 when the Boston Dental College was taken over as a department of Tufts College, Dr. Rice's services were retained. When the Boston Dispensary enlarged its dental department he was placed in charge and elected a member of the Staff; and he later served as instructor in the dental department of the Massachusetts General Hospital. In 1905, he completed a post-graduate course at Tufts Dental School and was granted the degree of D.M.D. In 1913, he became a member of the Faculty of Tufts College Dental School as Professor of Operative Dentistry, which position he still holds. Since March 27, 1916, he has been in charge of the afternoon clinic at the Dental School.

Dr. Rice is an officer in the Massachusetts Dental Society, and also in the American Academy of Dental Science; he is a past President of Boston and Tufts Dental Alumni Association and President of the Board of Publication of the *Journal of the Allied Dental Societies*. Those who know Dr. Rice best and have been associated with him in the performance of the duties of the various positions he has filled, feel that the quality of what he does is as important with him as the fact of it, and that both these are what they are, by reason of the high principles and motives from which they spring.

ALFRED G. RICHBURG, D.M.D.,

Editor Boston and Tufts Dental Alumni Association.

REPORTS OF SOCIETY MEETINGS
FIRST DISTRICT DENTAL SOCIETY OF THE STATE
OF NEW YORK

Feb. 5, 1917

A regular meeting of the First District Dental Society of the State of New York, was held on Monday evening, February 5th, 1917, at the Academy of Medicine, No. 17 West 43rd Street, New York City.

The President, Dr. W. B. Dunning, occupied the chair, and called the meeting to order.

The paper of the evening was read by Dr. J. Lowe Young of New York, and was entitled "The Coöperation of Dentist and Orthodontist."¹

Discussion of Dr. Young's Paper

Dr. P. R. Stillman—Dr. Young's paper reveals a clear conception of the necessities of our practices and a prophetic vision as to how dentistry must be practised in the years to come.

It is obvious that the trend of all things in this era is toward the development of specialists; this is as apparent in our own profession as in every other branch of endeavor.

The world is better for the work of a person who can excel in the doing of one thing, and it seems to me that the time is not far distant when our clientele must be served by groups of men whose community of interest is centered in the common idea of the welfare of the patient. There is no one man living today who can render dental service which is comparable in quality to the united efforts of certain groups of men in this room tonight; and many of these men whom I have in mind make no claim to being specialists, although they each have special knowledge and skill which makes them superior in their preferred branches of work.

Twenty-five years ago we were frequently told that dentistry was a specialty of medicine and there were many among us who held to such belief. We hear little of that sort of talk today. Dentistry ranks with any of the other learned professions and among its other increasing specialties, orthodontia takes priority.

¹ See Dr. Young's paper in full at p. 186, this number of THE JOURNAL.

Orthodontia deals with occlusion, which is the basic principle of dentistry. It is when occlusion begins to go wrong that the science of dentistry is called to the relief of humanity. It is to replace or prevent the loss of occlusal surfaces that fillings and inlays are inserted into the teeth, that restorations are made by means of bridges, crowns and plates, and it is through a faulty co-ordination of the dentures, that the destruction and devastation by dental periclasia of eighty per cent of all teeth that are lost, occurs. There is not an operation in dentistry but must be weighed as to the value of its occlusal relation. In proportion to the amount that the occlusal relation approximates the normal in any mouth, just to that extent may we prophesy the service which these teeth will render to the individual.

As a prophylactic measure alone, orthodontic service stands distinctly in the first place. For a correct and satisfactory orthodontic result releases the function of mastication, and thus brings to the organism an opportunity for development and health; it inhibits in a large degree infections of the investing structures by insuring a normal blood supply, and to a great degree eliminates traumatic occlusion which is a sequela of nearly all untreated malocclusion.

I wish to add my approval of Dr. Young's paper and to hail the science of orthodontia as the premier specialty.

Dr. E. A. Bogue—I certainly did not expect to be called upon to make any comments tonight, but in view of what I have heard within the last ten minutes, I think I will accept your president's kindly suggestion.

Dr. Stillman said a moment ago that orthodontia deals with occlusion. I am very sorry to hear, that—that is if he meant that is all it deals with; for so far as I can understand it, orthodontia ought to deal with the proper development of the permanent teeth.

I believe that orthodontia should prevent much of the evil which the orthodontist treats in the way of correcting occlusion.

I was feeling quite thankful that Dr. Young had become converted to early orthodontia, as I heard the remarks which he made during his description of his slides.

I want to criticize one point which he made as he was

showing the slides. He undertook to inquire—but he did not answer—what it was that caused a certain amount of irregularity. He alluded to thumb-sucking, and to thumb-pushing, and to habits of various kinds, in which he was quite correct; but he did not go far enough back, and that is where the medical profession and the orthodontists should come more in harmony.

The cause of the irregularities in the permanent teeth, which the orthodontist generally corrects, lies further back than the sixth year of life; and according to what we heard at Pittsburgh last summer, it may be—a portion of it—ante-natal; but in any event, I have yet to see more than two or three cases of serious irregularity that did not begin before the sixth year of life. I do not know whether Dr. Young can correct me in that. I saw one case today where adenoids were removed at two years, and at eight years great prognathism of the upper arch took place. Now comes the question, raised by the medical men, what causes that?

Another fact which came to me as Dr. Young was speaking was, that we may detect in early infancy a great many cases of impending irregularity and prevent them. Unless the temporary dental arch, I mean the arch of temporary or deciduous teeth when those teeth are fully erupted, measures 28 or more millimeters in breadth laterally, that child has not the physical power to develop itself normally.

You will forgive me if I recall to your remembrance that the word “norm” means rule, and unless the child is built according to rule, it cannot be correct. There is our normality.

Now I want permission to recount a little incident which occurred a few years ago. A physician brought his two children into my house, requesting examination and advice. Impressions were taken—models were made—and nothing was done.

Three years passed, and he again brought those children. Impressions were taken—models were made—and nothing was done. Three more years passed, and I then sent for him, and he brought three children this time, one born since the first one came.

The measurements of those models showed that there was not .001 of an inch lateral growth from the first to the last—six

years. It is now eight years nearly, and there has been no lateral growth.

I then looked up quite a number of models—of which I have a good many, and after looking them up, was able to announce what I stated a moment ago, that unless the deciduous teeth at the region of the second upper deciduous molars measured at least 28 millimeters, which means one inch and ten-hundredths in breadth, that child will not be found to have sufficient vigor and sufficient vitality to develop normally. Whether the fact has any significance, I am not prepared to say. It may be relied upon, however, so far as I can ascertain, as I have had it under observation ten or a dozen years.

Now comes another fact, and this is what gives me such pleasure in seeing my friend Dr. Young coming around to the view of some of the rest of us: if we take these deciduous arches, which we distinctly diagnose as too narrow, and spread them, we have only to spread and hold still, and the permanent teeth have ample room in which to come down.

Now some of my brethren have taken me to task because I have said that the heart was brought in—or should be. If the nasal passages of the child with its deciduous teeth still in place are not broad enough, that child cannot take oxygen enough into its lungs to enlarge its thoracic cavity as it ought to be enlarged. If that thoracic cavity is not enlarged, neither lungs nor heart will operate as they ought.

However, when we take these deciduous arches that are too narrow, and spread them, the child begins to stand erect, to take long breaths, and if its parents instruct it in deep breathing and give it plenty of hard and fibrous food to masticate—lo and behold! all the vital organs seem to improve, the child begins to grow to such an extent that the periodicity of growth, about which so much is said in pediatrics, ceases, and instead of stopping growth at six years, which is reqlently the case in white children, they go right on growing until adult age, and the partial arrest or retardation of development which usually takes place in our children between six and twelve is done away with to a great extent, or altogether.

Dr. D. Carrabine—I think it would be fair to put myself, for

the time being in the place of the general practitioner; therefore, as a general practitioner if I were contemplating sending my patient to an orthodontist, there are certain requirements that I should insist upon before this coöperation would be complete.

First, I should like to know where and to whom the orthodontist sends his patients for X-ray treatment. I should not under any consideration have my patient put in the hands of another dentist without my consent.

Another thing I should inquire about is in reference to the methods used. Within the last few years—there has been a tendency to get away from simplicity in treating orthodontia cases—there was an appliance invented which was a most difficult and complicated thing to adjust, and required most exacting technic. I condemned the appliance from the beginning, because it was not simple, its adjustment was painful and it required too many bands. I tell you a band does not do a tooth any good. Even a highly polished filling will collect food. A band will collect food, and little children will not take the time, and it is very difficult to train them, to take the proper care of the teeth. I believe as few bands as possible should be used, and the simplest way taken to restore the normal occlusion.

To digress for a moment from the coöperation of dentist and orthodontist, we are not correcting solely the malocclusion of the teeth, but the malformation of bone. This malformation of bone may begin at the age of two weeks—from a cold perhaps—from improper breathing or other causes. The teeth, when erupted, cannot occlude correctly on account of this lack of development.

There is just one thing in Dr. Young's most excellent paper that I disagree with. His idea may be better than mine, but I believe in putting the appliance on the temporary molars wherever I possibly can, and using them until they are lost. I do that because I am convinced that a band does not do any good to a tooth, no matter how well cemented. In Class II and Class III cases I cement the bands to the temporary molars whenever it is feasible to do so, because I can keep that sixth year molar thoroughly clean much better without a band than with it. By using the temporary teeth for anchorage, I have had some very fine results without banding the permanent teeth at all.

Dr. L. M. Waugh—The paper to which we have listened this evening appeals to me as being an extremely practical one. Dr. Young has refrained from going very deeply into scientific problems which relate to orthodontia, because his topic was one that was intended to be a message from the operating room of an exclusive specialist to his confrères in general practice, with the idea of merging the work of the two for the purpose of getting the best result for the patient; and it is from that standpoint that I have been especially interested in what he has said this evening.

Normal occlusion has been generally accepted in recent years as the basis for the practice of orthodontia. Normal occlusion, I want to say to everybody present, and I am willing to defend it, is the basis of practice for every branch of dentistry—just as important as for orthodontia itself. In fact, the two are inseparable. Orthodontia means correct position of teeth, correct striking of teeth; and when is a case of orthodontia begun, and when finished? Orthodontia is never finished, so long as the patient is alive. Orthodontia is practised by the prosthodontist, and he has the same principle as is practised by the most exclusive practitioner for straightening teeth, and the general practitioner must have just the same standard for his practice as the orthodontist.

We speak of an orthodontist as a specialist. I believe the general practitioner, as he goes along, unconsciously develops into a specialist himself, because of a liking for certain kinds of work, or because he has a certain aptitude for it. Unconsciously he becomes a specialist, and finds himself doing more of that special kind of work; but he may not become an exclusive specialist; so I like to draw a distinction in my mind between a specialist and an exclusive specialist.

When a man develops his practice, there comes a time when he is face to face with his conscience. He is endeavoring to do a little better work than in the previous case. When he realizes that he must do this thing, or repeat the errors of yesterday, he comes face to face with the question of his ability to do all branches of dental practice well enough to suit that gradually increasing ideal of his conscience, and I believe in orthodontia, in its application to the exclusive practice of straightening the teeth

of the young, he must either entirely lay aside his efforts to straighten the teeth of children, or he must do it to the exclusion of all other branches of his profession.

The exclusive specialist is developed in just this way. He must follow the bent of his inclination. If it leads him into special work, he must follow it to the exclusion of all other branches.

How much is a little patient the patient of the orthodontist? I believe that the patient is the patient of the general practitioner, who for a little time prefers to have that patient in the hands of the exclusive specialist for the correction of special deformities which exist, and there should be the most cordial feeling between the two. The little patient should go back to the general practitioner with a keener appreciation of the work the general practitioner is doing. So often a little word may be dropped, as was mentioned in the discussion, which may lead to the destruction of the confidence which the patient may have for one or the other. That situation should not exist.

Our society was told not long ago—a little bit to our humiliation, by a gentleman who appeared before us, not a member of our profession, that in no branch of the healing art were the members so prone to say discourteous things about their confrères as in dentistry. I find it sometimes to be so.

I make it a rule when I see a suspicious spot for the development of caries, when I see a cavity that should be taken care of, to mark it on a chart, and to send that chart to the little patient's dentist; and I have learned through experience that I must say something like this:

"My dear Doctor:—This O.K. chart is sent to you merely by way of suggestion, not with any thought of dictating what should be done."

I found if I did not do that, I would offend the general practitioner. I do not care to have him dictate what I shall do, and he has the right to feel the same towards me. You only have to do it once or twice, and after that there is a mutual understanding. You can find out whether he wishes to take responsibility for the prophylactic condition, or whether he wishes you to do so.

Frequently the teeth are kept clean by the orthodontist, as the

patient comes more often to the orthodontist during that period; but it makes little difference to me whether the teeth are kept clean by the orthodontist or the general practitioner, or by a combination of the two, so long as they are kept clean.

The question of bone growth is something we should take into consideration. We think of bone in the abstract, as we see it in the museum or by the wayside, as a dense, dead substance. The bone in the museum is a dense and dead substance, but as it exists in the anatomy, it is a living substance. It is $33 \frac{1}{3}$ per cent more substance than the museum bone, and it is a living substance. We must think of bone as a living, active substance, and the teeth as being living substance as long as the individual has teeth. We must think of support for those teeth, and that support is from their neighbors in the same arch. We think normal occlusion makes a beautiful ideal for orthodontia, but we rarely consider it as a condition toward which we should work. Dr. Bogue says "norm" means rule—normal relation to form. If we look in the dictionary, we will find it says common, or natural. Normal occlusion is common occlusion, or it is the principles upon which the most efficient natural contact may exist, and it is not an impracticable ideal. It varies in different individuals. There is no type of arch, but normal occlusion varies greatly.

This comprehension of normal occlusion—the morphology of the tooth plane, the marginal ridges, the contact ends, must all be taken into consideration, and form absolutely, not only the basis for orthodontia, but for all dental practice.

The work of the orthodontist is only transitory. In order to make it efficient and durable for the health and comfort of the patient, it must be guarded constantly by the general practitioner in every restorative operation he makes where areas of contact are made, and it applies to fillings embracing contact or occlusal areas, and to bridges, and even after the teeth have been lost, it applies to the substitution of artificial teeth. It is the same principle, applicable from the deciduous set right through life, including and governing the work of the prosthodontist; and when we grasp that, we will all work together, and there is no reason why it should not be done in entire harmony, for only in that way can we serve our patients in the broadest and best sense.

Dr. A. L. Swift—From the viewpoint of the general practitioner, some of the points brought out by the essayist regarding the coöperation of the general practitioner and the orthodontist appeal to me strongly. I firmly believe that the best interests of the patient demand such coöperation. When I place one of my patients in the care of an orthodontist, it is always my intention to coöperate with him in every way possible and to keep in close touch with the case until it is completed.

I instruct my patients to return to me at regular intervals for prophylactic treatment and for such other care of the teeth as may be necessary, but I often find that owing to the deep interest taken in the orthodontic work and the necessary amount of time, and the numerous visits to the orthodontist, the parents and patients seem to lose sight of the importance of regularly consulting the general practitioner, and thus fail to follow his instructions, often not putting in an appearance until the orthodontist notices some little cavities and sends the patient back to have them attended to.

The orthodontist should in every case insist that the patients return to the general practitioner at regular intervals for prophylaxis and general care of the teeth, thus securing his constant coöperation.

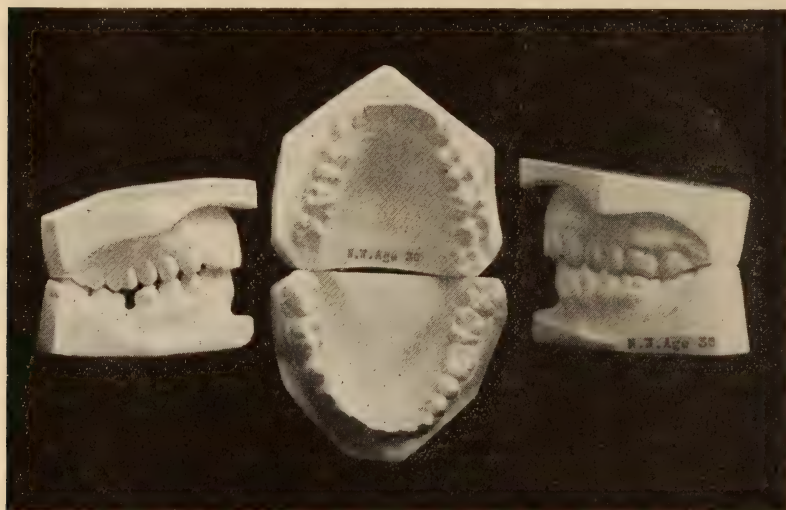
I always feel a personal responsibility for my cases, and as I consider the patient is still my patient, feel in duty bound not only to coöperate in every possible way with the orthodontist, but if occasion should arise where in my judgment, the best interests of my patient demanded a radical change of procedure, I should consult with the orthodontist, and if some satisfactory agreement could not be reached, should feel it my duty to advise the patient to seek other treatment. This course would be most embarrassing, but the interest of the patient should be the first consideration.

I am very glad to have heard Dr. Young's paper, and feel that his plea for honest, straightforward coöperation between the general practitioner and the orthodontist cannot be too strongly emphasized, since only through such coöperation can the welfare of the patient be secured.

Dr. Zentler—The essayist of the evening in his paper, which very ably relates the need of the proper coöperation between den-

tist and orthodontist, sounds to my mind, the most fundamental note of this subject, when he says: "The loss of one tooth, or any part of it will destroy normal structure and cause loss of function."

Among the essayist's slides, however, there is, I believe, none which illustrates this contention as well as this one slide (Fig. A), which I happen to possess and perhaps it may be worth while to have it published with the discussion of this paper.



The casts are of the mouth of a man thirty years old, who in his youth lost the lower right first molar, retaining all his other teeth: You see how the right side is entirely thrown out of occlusion, causing loss of function, while the left side has remained in good occlusion. The lingual and palatal aspects show how the loss of this one tooth in the mandible has caused a lack of proper development in the corresponding side of the maxilla, bringing about a deviation lingually in the alignment of the teeth in the arch.

Dr. V. H. Jackson—This afternoon I was asked to discuss Dr. Young's paper, "The Coöperation of Dentist and Orthodontist," and while I have not read the paper, I will present a few thoughts that occurred to me, during the reading.

I am glad Dr. Young has presented the paper.

It is necessary that the general practitioner of dentistry, and the orthodontist thoroughly understand, and respect the ethics of their relationship that they may work for the best interests of their patients.

I am an advocate of the early regulation of the teeth. The orthodontist should when necessary, expand the dental arches for young patients, to provide sufficient space for the free accommodation and regulation of the permanent teeth (adult teeth) before, or while they are erupting. At this period the arches are in their most developmental state, and are readily expanded.

If the regulation is delayed after the eruption of the permanent teeth, the bone and process becomes more dense and requires more continued force for their movement. The early lateral expansion is more effective on the body of the arches than later widening. This plan of treatment is required to cause sufficient room for the permanent teeth; to assist in shaping the arches during their development; to in this manner correct the occlusion of the teeth, improving mastication, and increasing the width of the upper arch to improve the nasal space. This re-shaping of the dental arch while it is in its early developmental stage, is following the plan one would use in training and shaping a plant. The dental practitioner has the advantage of this knowledge and should determine if the arches are developing sufficiently, and when more space is required for these purposes, treatment should be recommended and the patient generally referred to the orthodontist.

The roof of the mouth is the floor of the nose.

The bony system is the frame-work of the body to which the soft tissues are attached.

The normal bone formations of the nose are so delicate that the removal of bone by the rhinologist for relieving nasal incapacity is necessarily limited.

The correct plan for increasing the bony nasal space is brought about by the early expansion of the upper dental arch, stretching and re-shaping the palatine portion while it and all of the adjacent bony frame-work is in its most developmental state, as when the conditions require it, the liberal expansion of the

arch laterally is indicated, and the expansion continued with spaces between the teeth, if necessary, at least until all of the fourteen permanent teeth of the arch are erupted and in place; then the frame-work should be supported for a long time. In that manner, development approaching the normal plan will be encouraged.

It will be acknowledged that the most favorable result from lateral expansion of the arch is obtained by early treatment, beginning when the patient is as young as four to seven years.

Every child when three years of age should be examined, and when there is especial evidence of an irregularity, treatment should begin soon.

It is necessary that the general practitioner of dentistry and the medical practitioner work in thorough coöperation with the orthodontist, because they, in their routine work, are usually the first called to examine children, and when necessary, they should refer them to the orthodontist; otherwise the parents later will think that the treatment had been delayed too long.

In general orthodontia cases, the plan of delaying treatment until the child is ten or twelve years of age is a mistake. Some practitioners are still advising parents to delay the regulation until the twelfth year molars are erupted.

Some points have been touched upon that were not included in the paper. I have hesitated to introduce thoughts which did not bear directly upon the paper, but will speak hurriedly regarding the matter of fees for orthodontia services.

Occasionally a practitioner tells his patient, who contemplates visiting the orthodontist, that he wants to keep track of him, and suggests that "as for the regulating, it ought to be done for a certain sum." The patient calls on the orthodontist with that thought in mind. The practitioner generally has had no definite plan of estimating what orthodontia work should cost. He is unable to estimate how much outlay of time, operative work and other details will be required to correct the case. Therefore a few suggestions regarding fees for orthodontia service will not be out of place. Every man with experience necessarily sets a price on his time for rendering service, as the servant, the farm-hand, the minister, the physician, the dentist and the lawyer.

The dental practitioner thinks that he is worth a certain sum per hour, and every man whether he tells his patient so, or not, uses this plan of noting the time consumed as a basis to calculate what he should charge the patient for his services. He says (to himself) that he is worth \$5, \$10, or \$15 an hour. I think it will be admitted that if he can command those fees, he is entitled to the amount. The servant is worth his wage; the doctor, and the dentist can command a fee in amount commensurate with the general demand for his services.

In planning an estimate for himself as to the cost for his rendering orthodontia service to his patient, he could begin by figuring it on the basis that he has considered his services worth per hour, multiplying that amount by 52, the number of weeks per year, seeing the patient once a week on an average. If he follows up the case later, although there are times when he does not see the patient as often as once a week, he could in this way be fair to himself, and to the orthodontist. Ten times fifty-two is 520, or for treatment \$520 per year, and this generally should not include the cost of re-making of apparatus, etc. Then one should consider the time consumed by the patients interferences, broken engagements, sickness and accidents which must be taken into account; so the operator must be wise, tolerant and reasonable.

The orthodontist's fees for operations are often thought to be too high by the dental practitioner, the physician and the rhinologist, each of whom is inclined to be outspoken to his patients regarding the orthodontist's fees.

I think we now understand that the high fees of the orthodontist are charged on account of the general outlay and the considerable time spent.

If the orthodontia case requires two or three years' treatment, the cost to the parents should always include the added outlay. The patient should not be dismissed, but given treatment as long as he is being benefited.

Hereditary cases usually require more time in their treatment than do acquired cases.

To improve the breathing, the rhinologist removes the adenoids and thickened membrane, etc. The several, normal, ade-

noid developments, including the tonsils, are known as Waldeyer's Ring. Adenoid tissue remains after the swollen adenoid is removed, and it is liable again to become congested from irritation caused by the unusual force of the air in breathing when the nasal space is contracted, often necessitating that the swollen part be removed again. The orthodontist should keep these points in mind.

In the case of a child four years of age, the rhinologist said he had operated, and used sprays for his patient almost since birth; still the child was very anaemic when he was presented for orthodontia work and I was informed he was under treatment by a general medical practitioner for his constitutional condition. During the first fourteen months of treatment, the child increased in weight 43 pounds, his breathing being much benefited.

As we know, air is one of the vital stimuli. The orthodontist should do every thing possible to improve nasal breathing. I was glad to hear Dr. Bogue speak on that point.

It is interesting to know what the general surgeon thinks of the orthodontist's work. I regulated the teeth for a child of one of our great surgeons. He misunderstood the necessary outlay of time, etc., spent in the work and was disturbed by an ordinary fee, yet he amputates a limb in a comparatively short time and the patient is cared for by an intern, or hospital attendant, until he gets well. For the operation he usually gets a large fee.

At the request of the practitioner, the orthodontist should direct the patient to return to the practitioner, at intervals, for the general examination of the teeth and for cleansing.

The patient should be taught the plan of cleansing the teeth and the apparatus regularly, and the advantages of rolling the brush so that the bristles will pass between the teeth, should be demonstrated. This is best described by passing the brush across two pencils, the bristles being bent by pressure during the lateral brushing, when they necessarily jump across from one pencil to the other, not passing between them, while in rolling the brush lengthwise with the pencils, the bristles readily pass between. In brushing the teeth it will readily be understood that, using this rolling motion, the bristles will keep the proximal surfaces of the teeth well polished.

Dr. M. L. Rhein—I wish to comment on a remark by Dr. Carrabine that "Little children have not time to clean their teeth." I object to his assuming to say that from the standpoint of the general practitioner. I most seriously object in the name of the general practitioner, to such a point. What is the proper position of the general practitioner with the orthodontist on this question? We have heard a great deal to-night about the orthodontist failing to send back his patient to the general practitioner at proper intervals. Such a question should never enter into this discussion. If the general practitioner has a patient that is in the hands of the orthodontist, that patient is primarily the patient of the general practitioner. There is no reason why the orthodontist should send that patient back to the general practitioner. If he is a real patient of the general practitioner, he comes back to him because the general practitioner sends for him, and sends for him as regularly as he deems it necessary to send for him; and if he is having orthodontic work done, that should mean not less than once every four weeks.

I would like to recite an incident that actually occurred in this city a few years ago. A certain general practitioner referred a patient to a certain orthodontist, and at the end of the year he saw the patient. He had not seen that patient for a year—for which I claim the general practitioner was responsible. He came to me and asked my advice.

He said "I saw this boy today for the first time, and I am heartbroken. The orthodontist to whom I sent this boy has done, as far as I can perceive, very little in the way of orthodontia, but he has inserted a removable fixture which I find in such an unclean condition that his mouth is full of caries—cavities all over—filth all over."

I said to him: "Do you want my opinion? I think neither one of you is fit to be trusted with this patient. I think it is your place to take this child away from this orthodontist immediately; but I want to tell you if I have a patient, I consider it my duty to see that that child shall report to my office once a month."

That has been the invariable rule in my office, under those circumstances. I do not wait for permission of the orthodontist, or for him to send the patient back to me.

Something has been said about where the prophylactic work should be done. It should be done by the general practitioner. No other thought should enter the minds of either party, because only at the completion of a prophylactic service can the practitioner have a due appreciation of whether anything is happening in the little patient's mouth.

What happened in this case I recited to you? A year later, this practitioner, forgetting that he had told me this story a year back, asked my advice again, and told me the same story—only now it was two years since the orthodontist had had the child.

I said: "You have forgotten you told me this same story a year ago. And you still have permitted this child to remain in the hands of this practitioner of orthodontia?" He answered: "What could I do? My hands are tied. Can I go to the father and mother, and tell them I have made a mistake in referring the patient to So-and-So? Can I incur the enmity of Dr. So-and-So by stating he has not done his duty properly?"

I said, "if you have a proper appreciation of your duty, there is no other recourse. We have unpleasant things thrust upon us in this life, as well as pleasant things." He said to me: "I can see you doing just this thing. You are looking for trouble, but not I."

Let me tell you the sequel of that story. That boy went down with typhoid fever six months after, and died. I forgot to state that part of the story was that the boy's mouth had gotten in such a state that mastication was almost an impossibility.

I am not drawing on my imagination, but I am trying to bring into this discussion a point that has been evaded. I will admit Dr. Waugh said it made no difference to him who cleaned the teeth, as long as the teeth were kept clean. I have discussed this matter with other orthodontists whom I esteem as much as I esteem Dr. Waugh, and where the general practitioner has failed to do his duty, they have had to step in.

The point I want to bring into this discussion is, that if that child has a dentist, it is the dentist's duty, because the orthodontist's service is an evanescent one, and the patient leaves his hands. He is in the same position as the surgeon who performs an

operation, and when the service is finished, the patient comes back to the general practitioner.

Dr. Young—I am very glad that my paper brought out some discussion. In my closing remarks, I will confine myself to those who have discussed my paper. To those who have not discussed my paper, I will have nothing to say.

Dr. Bogue made a statement—I am sorry he has left the room—that he was glad to see I had become converted to the idea of early treatment. It was never necessary for me to become converted to early treatment—I always believed in it.

In regard to what Dr. Swift has said about the return of the patient by the orthodontist to the general practitioner, I think Dr. Rhein has answered that question as I would have answered it.

I believe it is the duty of every general practitioner, if he has the interest of the patient at heart, to have that patient return to him as often as the dentist wishes. When a dentist refers a patient to an orthodontist, he is still responsible for the patient's welfare. In fact, he is more responsible and the patient should, if anything, be looked after just a little more carefully, particularly if he should be the first patient put into the hands of that orthodontist.

Furthermore—and this is something that I did not put into my paper, and that I wish I had—I have never felt that because a dentist referred one member of a family to me, that I was at liberty to care for the whole family. Other members may come in, but they are not my patients until they are referred to me by the dentist. If he has referred one member, and not the others, he may have some good reason for it, and I do not advise treatment for the second or third child until the dentist says so.

Dr. Nash—Is it not taken out of your hands by the parents suggesting it?

Dr. Young—Sometimes the parents say: "I would like you to look at Johnny. I have another little boy, too, whom I want you to look at." I will do so, but I am as mum as an oyster, and I communicate my opinion to the dentist.

Your first duty is to your patient. That is the duty of every professional man. The dentist refers the case to Dr. A. It is

the first case he put in Dr. A's hands. If Dr. A. makes good and meets his entire satisfaction, the dentist may want to send the next member of the family, and other patients. When a man is a specialist, he has no right to grab every member of that family.

The points Dr. Swift brought out should always be in order, if it is deemed advisable.

Of course, what I have said about Dr. Swift's discussion makes it unnecessary for me to say I agree with Dr. Rhein's point of view, because it is practically a repetition.

I thank you very much.

A cordial vote of thanks was tendered to Dr. Young for his interesting paper.

Adjournment.

WM. J. LEDERER, D.D.S.,
Editor, First District Dental Society, S.N.Y.

Boston and Tufts Dental Alumni Association

One of the most enjoyable and instructive meetings that the Boston and Tufts Dental Alumni Association has ever had, was held at the Hotel Lenox, Monday evening, Feb. 5, 1917. In spite of the "near" blizzard which had raged all day, there was a surprisingly large attendance. The business meeting was called to order by President Barton at 6:20 P. M. and various matters of a routine nature were disposed of.

The most important committee report was that regarding the matter of a Dental Dean, and upon the announcement that a former President of the Alumni Association, Dr. William Rice, had been selected for this honorable position, there was general satisfaction, and approval of the action of the Board of Trustees of Tufts College was expressed on all sides. It was quite a feature of the meeting to find such a happy solution of this problem. There was noted a very general offer of support on the part of some of the most skilful and well known dentists in the state. The following resolution presented by the Chairman of the Committee on Dental Dean was passed unanimously.

"The Alumni Association of the Tufts College Dental

School, having already signified its belief that the best interests of the School would be promoted by the appointment of a Dental Dean, wishes to express to the Trustees of the College, appreciation and approval of their recent action in selecting Dr. William Rice for the position indicated. The members of the Association voice their feeling at the present time with greater heartiness in the conviction that for solving the problems which will arise in connection with the change from a three years to a four years course of study, there will be needed all the wisdom which an intimate acquaintance with the dentist's standpoint can supply, together with a thorough understanding of the wider interests of the profession, its organizations for greater efficiency and its ideals, distinctive spiritual strength and glory, which the members of the Association believe can be provided in the dental profession, or in any profession, only through its own channels.

"The Association wishes also to express its hope and purpose to increasingly become a helpful adjunct to the Dental School and the Governing Body of the College."

Two new members were elected and adjournment was made to the banquet hall.

After this important matter had been attended to, to the satisfaction of all, there was a brief time allowed for the purpose of hearing the outline of a plan whereby the dental alumni will become a part of the General Alumni Association of Tufts College. Mr. George Miller, Secretary to President Bumpus of Tufts College, went into the details of the proposed merger in his usual earnest and convincing manner and as a result, a committee of three members was appointed to report at the next meeting. This will mean that the dues will be raised to \$3 per year, and in return, every member will receive a copy of "The Graduate Magazine."

The speaker of the evening was then introduced and with the aid of lantern slides gave a very clear and interesting exposition of a big topic. The subject presented was "Oral Diseases of Ancient Nations and Tribes." Beginning far back in pre-dynastic times, various types of skulls were shown in which the ravages of abscess conditions were clearly demonstrated. There

were indications also that the bane of the modern dentist, pyorrhea alveolaris, flourished even in that far off and distant era. The skulls of some of the ancient Peruvians showed traces of having been operated upon for the purpose of giving relief. The essayist, Dr. Kurt H. Thoma, lecturer in Oral Histology and Pathology at the Harvard Dental School, was accorded a hearty vote of thanks for his able paper.

The discussion was opened by Prof. George A. Bates of the Tufts Medical and Dental School, and it was of the same high calibre as that which had previously been said, Dr. Bates' slides, showing the progress of evolution along the lines of the dental equipment of man, were of great interest and value. The various reproductions of the so-called Piltdown skull and the Neanderthal man were shown. Dr. H. H. Piper was called upon and gave a very material addition to the subject under discussion. Dr. S. A. Hopkins commented favorably upon the type of meetings which were held by the Association, while Dr. Brigham also contributed a most interesting fact to the topic under consideration.

Adjournment was made at a seasonable hour.

A. G. RICHBURG, D.M.D.,
Editor, B. & T. D. A. A.

FIRST DISTRICT DENTAL SOCIETY OF THE STATE OF NEW YORK

March 5, 1917

A regular meeting of the First District Dental Society of the State of New York was held on Monday evening, March 5th, 1917, at the Academy of Medicine, No. 17 West 43d Street, New York City.

The President, Dr. W. B. Dunning, occupied the chair, and called the meeting to order.

The paper of the evening was read by Dr. Arthur D. Black, of Chicago, Ill., and was entitled "Studies of the Investing Tissues of the Teeth as a Guide for Treatment of Chronic Alveolar Abscess and Suppurative Pericementitis."¹

Dr. Arthur D. Black.—It is a pleasure for me to again appear before this organization. I think possibly I might say a word anent the announcement which has been read regarding the coming meeting of the Section of Stomatology of the American Medical Association, in view of the fact that I have been placed in the position of chairman of that section.

It has been the policy of the Section on Stomatology of the American Medical Association practically since its organization to devote its efforts along lines a little different from what we might term the regulation dental society work. Appreciating the fact that this section was, in a way, more or less of a connecting link between the dental and medical professions, it has devoted its time and interests largely to those subjects which would be of interest to both physicians and dentists; therefore the programs of this organization have not included some of the subjects which would ordinarily be found in the program of a dental society. However, I am sure the members of this society would find much to interest them in the program of the section which will meet here in June, especially in the various phases of focal infection, because we will get together a number of dentists and physicians who have been studying this particular subject from different angles, and it makes a very happy combination.

Discussion on Dr. Black's Paper

Dr. Arthur H. Merritt.—In discussing Dr. Black's very excellent paper, I shall do so as a clinician and not as a histologist,

¹ See Dr. Black's paper in full at p. 197, this issue of THE JOURNAL.

and shall consider very briefly, the possibility of regeneration taking place in the investing tissues of the teeth following pyorrhea and chronic apical infections.

Fortunately, this is a subject about which no one need to speculate. Either regeneration takes place, or it does not, and if it does, it carries with it, its own proof, a proof which no amount of speculation can overthrow.

Is it true that "suppurative detachments of the peridental membrane are permanent detachments?" What evidence is there that the cementum is "practically a necrosed tissue" following such detachments? Are the cementoblasts permanently destroyed? Is reconstruction of the bony investment of the teeth impossible? Have we no right to expect a return to normality in these tissues once they have been the subject of suppurative infections? These are exceedingly important questions which should be carefully considered.

Any one who has been an intelligent student of our current literature, cannot have failed to note the gradually accumulating evidence that reattachment in suppurative infection of the pericementum may, and under certain conditions, does take place. In *Dental Items of Interest* for June, 1916, Dr. T. Sidney Smith says that "Periodontal diseases are not cured unless the pyorrheal pockets are entirely obliterated, and this result can be secured in the case of vital teeth by inducing the separated tissues to form a reunion with the cementum. I have found that when conditions are right, this reunion takes place with the same rapidity and regularity that occurs in the healing of other wounds. Old age and systemic diseases—do not interfere with healing here more than in other parts of the body. The separated tissues will form a vital reattachment to the roots of living teeth if proper surgical methods are employed to assist them." In *Dental Cosmos* for August, 1916, our fellow member, Dr. Paul R. Stillman, says that "complete obliteration of the pyorrheal pocket and a true reattachment of the periodontic tissues to the tooth root in a state of health" does take place—"a result never yet obtained by other than true surgical technic."

Subject to certain conditions, my own experience confirms these statements. The first and most fundamental of these con-

ditions is that the teeth be vital. Reattachment will not take place about non-vital teeth, which suggests that in some way, as yet not clear, the cementum may receive nourishment through the dental pulp. If that portion of the cementum which has lost its pericemental investment were nourished by that which remains, reattachment might then be expected to take place about non-vital teeth. Inasmuch as this has never been observed to happen, it is fair to assume that the pulp is a controlling factor. The fallacy, therefore, of destroying pulps in the treatment of pyorrhea, must be obvious. Another prerequisite to reattachment is good root surgery. This means not only the removal of all calcareous deposits, but the *complete* removal also of the necrotic pericementum. When this has been done, physiological contact with the living cells of the cementum has been made possible with those of the overlying soft tissues. Without such contact reunion is impossible.

Still another condition is the elimination of occlusal trauma. Reattachment will not take place about teeth which are constantly being driven by their antagonists outside their normal limits of motion. The importance of this has never been appreciated, and until it is, there will be failures and rumors of failures. And lastly, it is essential that the most scrupulous and painstaking care be given to the teeth and their investing tissues by the patient. Undoubtedly one of the chief predisposing causes of pyorrhea is a local malnutrition of these tissues. It is essential to their health and reconstruction that they be well nourished. The importance of vigorous massage, intelligently applied, must therefore be obvious. These are only some of the conditions which must be observed, and which must be carried out to the minutest detail before one has a right to expect any thing more than the most temporary improvement. When this procedure has been followed, the gums speedily resume their health, new bone, as shown by roentgenograms, is formed, the teeth become progressively firmer, followed by a more or less complete obliteration of pockets. That such results do not always follow what seems to be the most painstaking care, should be emphasized. Failure has always gone hand in hand with success. Low recuperative powers may explain some failures. Pulp of low vitality doubtless ex-

plain others, but if all the facts were known, faulty technic would probably account for most of our failures in the treatment of suppurative infections of the investing tissues of the teeth. All the conditions essential to success have not been met in spite of what seems to have been painstaking care. This explains also why it is that so many are pessimistic regarding the reconstructive powers of these tissues. They have not discriminated between that which was skilfully done, and that which was not, and have ascribed their failures to a necrotic cementum, when as a matter of fact it was due to inefficiency of treatment. These failures, however, should not obscure the fact that results such as those enumerated above do take place, *and do so as a rule*, in the hands of the skilful periodontist.

The exact nature of these regenerated tissues, and the conditions best suited to their development is not clear. They have never been so far as I know, the subject of histologic study. That reattachment to the cementum may take place is indicated by Noyes in his book on Dental Histology. In it he says, "It is important to remember that whenever the fibers have been stripped from the surface of the cementum, they can be reattached to it only by the formation of a new layer of cementum, building the fibers into it. This is certainly possible if conditions are properly controlled, but the cells of the tissues must be in a normal and vitally active condition, and the surface of the root must be such that they can lie in physiological contact with it. The cure of pyorrhea, therefore, becomes a biological problem. In this connection, it is important to remember that a surface of cementum which has long been bathed in pus, may be so filled with poison that no cell can lie in contact with it, and perform its functions." I am sure every one will agree with Drs. Black and Noyes that reattachment cannot be expected to take place between living cells on the one hand, and "pus soaked" cementum on the other, but that cementum which has been the subject of suppurative infections is necessarily "pus soaked," is in my opinion, doubtful, and certainly has not been proved. That such conditions may exist is probable, but that any large percent of failures in treatment is due to that fact, is exceedingly doubtful. The question then, is not whether the cementum may

not, under these conditions become pus soaked, but whether it is necessarily so to the extent of precluding reattachment. To the latter question, I desire to state as emphatically as I can, that it is not. I heartily agree with Dr. Black in what he says regarding the use of antiseptics, ionization, vaccines, etc. There can be no doubt that in many instances they not only do no good, but are a positive injury. They are certainly unnecessary. No more important contribution has ever been made to the subject under discussion than what Dr. Black says regarding the prevention of pyorrhea. He is wholly right when he says that gingivitis always precedes pyorrhea, that "the dental profession does not so much need specialists in the treatment of the diseases of the periodontal membrane as it needs every dentist to be a specialist in the prevention of these diseases." When the profession heeds this lesson, it will have solved the whole problem of pyorrhea and its treatment.

Dr. M. I. Schamberg.—I deem it a privilege and a pleasure to discuss this important presentation. Many of us have been aroused within the past few years as to the methods by which we ought to cope with the important subject of focal infection as it applies to stomatology. In other branches of the healing art, there seem to be well-defined methods of combatting infection. In some instances these methods are more readily applied than in others; but in most of them distinct and radical means of promptly getting rid of the infection have been applied, leaving no step untouched that would fail to bring about that end. Only within the specialty of dentistry has this attempt been short of its accomplishment. I feel that the problem is a very serious one. I feel that in the relations that take place between the dentist and the physician—the consultations that occur—the reference of patients back and forth from the physician to the dentist and the uncertainty of results—the great trouble lies in the fact that no great amount of good can come from it all, unless the dentist is prepared to do what is asked of him and that is, to eliminate all infection from the mouth.

It is immaterial whether in any particular case the patient's cardiac lesion or arthritis is directly traceable to that infection. That infection must be eliminated. I am convinced that in many

cases the secondary troubles are not due to oral infection alone, but to that infection plus something else.

Our essayist comes to us to-night with the thoroughness of thought and method displayed by his much revered predecessor, G. V. Black, and he comes with a statement made by the late G. V. Black which I believe to be true, that a suppurative detachment of the peridental membrane is a permanent detachment. He has endeavored to show us by the study of the adjacent structures to the tooth that there are certain conditions going on there which make reattachment absolutely impossible.

He has called to our attention again—for we have known it—that the peridental membrane is a highly specialized tissue and that it does not regenerate. It corresponds precisely with what we find in the entire tooth structure itself. What dental practitioner has ever seen the enamel or the dentin of the tooth regenerate after caries has taken place? That is entirely in contrast with bone. Bone will regenerate and I hope at the next meeting of the section of stomatology of the American Medical Association which will be held here, to present a paper on this subject of bone regeneration, in which I will show patients and radiographs which will prove such results through pictures taken before and subsequent to surgery of the part. In several of my cases, complete bone regeneration has been brought about of one-half of a jaw lost through necrosis and in many other instances, marked reconstruction of bone to a greater and lesser degree. Bone is not a highly specialized tissue and therefore is the type of tissue which will regenerate.

The same is not true of a transitory tissue like the alveolar process. The alveolar process will not regenerate. Every now and then we hear men state that they have regenerated the alveolar process. I have never seen a case of regenerated alveolar process. I have seen regeneration beyond the point where mucoperiosteum exists, for there we find true periosteum.

Now in regard to the conclusions that Dr. Black has drawn: I believe that truth will always out. He has come with a statement which clinical experience should have taught us long ago; that suppurative detachments of the periosteum are permanent detachments. In the past, both the dentist as well as the phy-

sician have been tempted to accept the comfortable tooth as a healthy tooth. To-day we know that to be a great error.

I am very skeptical about ionization—about its real merit in the cure of apical infection. I cannot conceive of any method, electric or chemic, or a combination of the two, that might bring about the selective destruction of micro-organisms without the destruction of the tissue enveloping these organisms. If ionization is carried to the point of the destruction of the organism, then there is likely to be the destruction of healthy living tissue. That is one reason why we cannot always use as strong drugs as we should like, they would destroy life in the attempt at destroying the organisms within the tissue.

The difference between surgical methods and the destruction by ionization is that in surgery we remove what has been destroyed and in ionization we do not.

I did not think from reading Dr. Black's paper that he favored root amputation, because of the line in the picture which he said was evidence of granulation tissue. If it were a granulation tissue enjoying recuperation rather than degeneration, it is not a dangerous matter; but if there remains good pabulum for the growth of organisms, I believe even root amputation will have to pass on as one of the methods not to be employed.

I am convinced that the treatment of pulpless teeth rests on one of two methods, that is, after distinct separation at the apical end has taken place—either the extraction of the tooth, or the cutting off of the end of the root.

We do not discover more than 5 per cent of pulpless teeth that through the medium of the X-ray we believe to be healthy; and when I say that, it leaves a percentage of even those probably harboring organisms. That is rather a lamentable state of affairs, in view of our knowledge of the dangers of deep-seated infections.

The reason that these infections are so dangerous is because they are deep-seated and in a type of bone structure where their transmission to remote parts of the body is more liable than from surface infections. The lacunae, the canaliculi and the haversian system and the cancellous nature of the bone, permit of the more

rapid transmission into the circulation of these organisms and their by-products.

The paper, unfortunately, is not constructive. Everyone is looking for some means of conserving teeth in a more safe manner than heretofore. We must, however, for the time being, place ourselves in a state of mind to accept the suggestions contained in the closing remarks of the essayist, that dentistry of the future will largely depend upon the more careful attention to the prevention of dental diseases, those that are gingival and those that apply to the destruction of the enamel and dentin of the tooth.

Do not permit the pulp to become involved, if possible. Spend any amount of time teaching the patient to clean the mouth. Prevent dental caries so you will not have to cope with infection later on; but when you do meet with focal infection associated with the teeth, you must do as our country is doing at the present time, you must cope with the condition as you find it, no matter how distasteful the task may be. You must live up to what Dr. Mayo asks of us; to show that dentistry will do its share in the prevention of disease and become an important factor in the art of medicine.

Dr. M. L. Rhein.—While we all have enjoyed the talk of Professor Black, of Chicago, I am sure, and the beautiful pictures which he has shown on the screen to-night, his paper has been a great disappointment to me, for the reason that it was destructive, without any attempt at construction. If, as dentists, we should agree with the view presented to-night by Professor Black and Professor Schamberg, there is only one thing to do with a pulpless tooth, and that is, extract it. No other impression can be left, after listening to what these two gentlemen said, and I would like to add a word to the splendid retort given by Dr. Merritt on that subject.

The thing that impresses me is the lack of consistency that is evident in the remarks of both Professor Black and Professor Schamberg. With Professor Schamberg, it seems to be a question of blowing hot one day and cold the other, on the subject of alveolar regeneration. To-night, both of these gentlemen speak in dogmatic terms about specialized tissues not regenerating.

I have no objection to either of them asserting that this is their opinion. Each of us is entitled to an opinion. What I am saying is my opinion, and what Dr. Merritt stated is his opinion. I coincided with Dr. Merritt, and what Dr. Schamberg said appeared to coincide with Dr. Black; but I do object to the tone in which they enunciate the statements they make. It is almost an axiomatic fact in physiology that all tissues are reproductive—given nutritive circulation and an absence of infection.

One of the things I would like to say in defense of New York *versus* Chicago, is that I resent for New York the imputation of my friend from Chicago that this society requires exactly this sort of instruction, either in histology or patho-histology; also, I object seriously to the statement that the different technics that have been evolved for placing pulpless teeth in a condition where infection has been removed, and there is no possibility of its return—have been enunciated without due regard for histology or patho-histology.

The proof of the pudding is in the eating, and Dr. Merritt has shown us some beautiful illustrations of regenerative structure. Dr. Schamberg says it is true bone, and not alveolar structure. I do not believe Professor Black agrees with Professor Schamberg on this subject, because his point is that he is in doubt whether there is an attachment.

Professor Black has failed to study the technic which I evolved for this purpose. I agree with Black in the statement that in most cases of detachable pericementum where infection has existed to any extent, under ordinary circumstances a re-attachment is possible only when due recourse is had to a scientific technic.

I would like to call his attention to the fact that that is one of the main points of the technic which I have introduced, and which I know is being successfully carried out by hundreds of dentists throughout this country. It is impossible to reply to all of the silly objections that have been printed in regard to this technic, and that come out month after month in the journals; but I am sure Dr. Black has failed to appreciate this one fact—that I thoroughly appreciate the truth of the one point he has brought us to-night, and that I have overcome it. How? By

recognizing the fact that due to these exposed portions of cementum from which the periodontal tissue has been removed, we must eliminate the infection first, and then treat the exposed cementum similar to the manner in which we treat ordinary dental caries. We must mechanically insulate these exposed surfaces, so they are impervious to any destructive action, and we have accomplished this purpose when we encapsulate the surface with gutta percha, which permanently protects it from any destructive action.

I have followed out this same form of treatment in what is termed a pyorrheal pocket under similar conditions, and I have obtained similar re-attachments. How? My gutta percha is glued, so to speak, to the cementum, and the exposed portion of this gutta percha now becomes imbedded in the newly constructed tissue.

I do not care to state anything more about what the tissue is in the periapical region, other than to say that in my opinion it is not true bone. I say that from a careful study of many roentgenograms under magnification; and where they have been taken in such a way that due attention is able to be given to the detailed histological character of the structure. True bone does not look like this; but this does look like alveolar structure. I may be wrong. It is simply my opinion.

I have wanted to say these few words in addition to what Dr. Merritt has said, for the encouragement of those men who are practising dentistry, and are unwilling to sacrifice devitalized teeth. I want to emphasize also what Dr. Merritt said, that there is no field in surgery that ever claims 100 per cent successes; but when Professor Schamberg states that 5 per cent and less of such teeth are placed in a condition where infection has been eliminated and cannot return, it simply illustrates the fact that in his occupation he comes in contact with the failures—he does not see the successes. (Applause).

In regard to the strictures on ionization that have been made to-night, I believe, as I said here at a recent meeting, that I am the guilty victim of having introduced ionization into dentistry at the suggestion of Dr. Morton. It never was my thought or idea—and I object most seriously to the construction being

placed upon it—that ionization cures anything in the line of infection. Ionization undoubtedly produces a certain hyperemia. Ionization unquestionably from the research work I have been engaged in will leave that tissue free from microorganisms for a certain length of time—limited I know in severe types. That is not a cure, but it is part of the treatment for eliminating certain pathogenic conditions, so that the surgical skill of the dentist can now be used to put this gutta percha encapsulation over the end of the root at a moment when no infection is present. When that is done, microorganisms may return to that locality, but there is nothing for them to feed upon. There is no nutriment there for them.

There is just one other point in Professor Black's paper which I enjoyed very much, that I want to talk about. He gave his opinion on the epithelium that is found in the peridental tissue. I differ entirely with him, and I may be as wrong as he may be right. I agree with Professor Kirk in this respect, because his findings agree with my own observations, which have been very extensive. I do not believe this is a normal constituent that is found in the peridental tissue, and I do not think it is found as frequently as he states, although I realize that it appears there quite often. I certainly feel, however, that the opinion brought to us by Professor Kirk that this is the remnant of enamel accidentally or abnormally left behind, is correct. How a legitimate construction can be made that this should be a defensive agent, I cannot understand; because this epithelial structure contains precisely the character of nutriment for which these microorganisms are in search.

As I look upon it, the pericemental abscess which he discussed is simply caused by the fact that the instinct of the microorganism leads it to these isolated portions of epithelial structure left behind since there it finds this nutriment. This is only a suggestion. All of these things are more or less suggestions that have not been proven; but one is as much worthy of credence as the other. You are at liberty to take your choice.

Dr. Kauffman.—As you perhaps know, I did a little work in implantation a few years ago. I found that the cementum was not negatively chematactic if certain antiseptics were applied. Not

only was it not negatively chematactic, but I proved that in 1/200 of a 7% iodine and normal salt solution these tissues would grow. Where implantations were made with a healthy pericementum the tooth was retained, and the histologic slides showed a healthy cementum about those teeth treated in this manner.

Where the periodental membrane was lost, I obtained a fibrous tissue union between the alveoli and the tooth structure.

Dr. Black (in closing).—I have enjoyed listening to the discussion of my paper, for a paper which does not bring out some contrary discussion is not worth very much.

There was one item especially in connection with Dr. Schamberg's remarks that I wish to mention, referring to his statement regarding pulpless teeth. I did not speak of pulpless teeth at all. You must differentiate between pulpless teeth, and teeth that have abscesses. There may be a tooth with a dead pulp without an abscess, and that is an entirely different proposition to handle from an abscessed tooth; the main point of difference being that the periodental membrane is intact in the one case, and part of it has been destroyed in the other.

The thing I wanted to impress above all else is the condition of the cementum. Regardless of what may be the condition of the pulp, our problem is concerned primarily with the cementum. I appreciate the quotation Dr. Merritt presented from Noyes' Histology, and I want to quote a sentence² from the same book a few pages further on: "If this portion be bathed in pus for a long time, the cement corpuscles are killed, and the tissue becomes saturated with poisonous materials, so that tissue cells can not lie in contact with it and live."

I am quite familiar with roentgenograms such as Dr. Merritt has shown. I have similar ones myself. The principal mistake many of us make in attempting to prove things by roentgenograms is the fact that we have not followed our cases long enough. Sometimes we have been more or less deceived by the difference in the angles at which various X-ray pictures of the same case have been made. I want to call your attention to two of the pictures the Doctor showed; one displayed more

² Dental Histology, Noyes. Second edition, p. 163.

deposit of bone than the other, yet attention was not called to the fact that the same tooth was one-fourth longer in the one than in the other. I want to impress on you the fact that you must not believe all you see in roentgenograms, for if you do, you will get badly fooled.

I have a series of about twenty roentgenograms of a single tooth which was abscessed. I put in a gold filling in January, 1914. The tooth was an upper cuspid; the pulp was alive. The patient came back the latter part of July, with an acute abscess. A roentgenogram was taken soon after the abscess was lanced, showing quite a cavity in the bone into which the root end projected. I believe the pulp had died soon after the filling was placed and there had developed a chronic alveolar abscess which had destroyed the bone long before this acute abscess occurred.

I have had roentgenograms taken at different intervals during the past three years, and those taken a few months after the removal of the pulp show the bone built in about the end of the root, apparently a perfect result. But another picture, taken three months later, shows a hole in the bone again; another six months later shows it partly built in. What do these changes represent? To me they represent different stages of resistance and reinfection. There may be no pus there at times and some men would say the condition is a safe one. There may be nothing but granulation tissue; it may not be much inflamed; it goes on for weeks, or months, or years without giving trouble. But suppose the patient's tonsils become infected? The infection gains access to the circulation and attacks that granulation tissue about the root apex and more or less of it is destroyed. It is a weak spot which is unsafe. With an epidemic of tonsilitis, we usually have an epidemic of alveolar abscesses, which means that the granuloma have been the subject of renewed attack.

I have seen the pictures of Dr. Sidney Smith, showing the regeneration of bone, and I do not doubt them at all; neither do I question that much bone has been built in in these cases shown by Dr. Merritt tonight. I know of the case of a young lady of ten, who fell out of a swing and knocked out an upper central incisor. She fell on the porch of her home. Her mother had told her not to swing that morning, and consequently, in

fear of getting a whipping, she did not tell her mother anything about it. She picked up the tooth, washed it off, and shoved it back into place. When that girl was forty years old, that central incisor was in place, and the pulp was alive! (Laughter). That woman was the wife of Dr. Edmund Noyes, of Chicago, and he tested the vitality of the tooth many times in the course of her life.

Dr. Rhein.—How did he test it?

Dr. Black.—He tested it with warm gutta-percha and other methods.

Dr. Rhein.—There are none you can rely on.

Dr. Black.—It is quite possible with the large apical foramen at that age that there was prompt union and the pulp tissue remained alive. I only cite that case to emphasize the fact that there are a few cases which are contrary to the rules, and that we should not use freaks of nature to direct routine practice.

I do not believe in Dr. Rhein's idea of the use of gutta-percha, and I think after a time he will stop using it. When I can take a bur and drill a hole through the side of the root, then plug the hole with gutta-percha, and have the case go along in safety, I will believe in that method of treatment.

Dr. Rhein.—Have you ever tried it?

Dr. Black.—No, and I do not believe I ever will, because I think it is wrong in principle.

It has been said that this is not a constructive paper. I want to take exception to that statement. I think it is a very constructive paper. It is a question of the purpose of the man who is practising dentistry to-day. Years ago, the chief purpose of the practice of dentistry was to save teeth. That to my mind is not one of the chief purposes to-day. To-day it is to promote the health of the patients who are under our care, and we put that before the saving of an individual tooth or a whole set of teeth. (Applause).

The dental profession has gone the limit in its endeavor to save every tooth that could be held in a patient's mouth. We must quit it, if we want to hold our standing with the medical profession. This paper is constructive, if it will teach a man to look straight in the face of those problems.

This paper is constructive if it teaches men to note the difference between the danger to health that exists in a patient's mouth, or the lack of that danger. I am willing to leave this matter with any individual in this room,—if you will take careful note of your cases, and make careful record of those in which you get re-attachment, and of those in which you do not; and for those in which you do not, if you will follow the plan of procedure I have here suggested, I will be satisfied—if you will just be honest with yourself in doing that thing.

I am sorry if, as Dr. Rhein has suggested, I have presented too much of elementary histology and pathology. My presentation was based on the showing of our dental literature to-day.

I did not make a positive statement about ionization, one way or the other. I simply called attention to some of the possibilities or probabilities of it. I did not question that ionization would sterilize a field, but I did question whether it did the field any good by sterilizing it. You can sterilize a field with many antiseptics; but surgeons do not do so, because the antiseptics do more harm than good.

Dr. Chayes.—Ionization might properly be called an excitant—exciting the processes of the body into activity. It might be likened to the blood stream itself.

Dr. Black.—You may call it a hyperemia, but that does not prove that the hyperemia does any good. You can go around the ring as many times as you want; you must come back to the consideration of the cementum.

Take the soft tissue that is infected; how quickly does it rid itself of that infection when the tooth is extracted? Right away. It puts up a splendid fight all the time. That is what protects us.

What we want to get at is not so much the organisms that are in the soft tissue, but the thing which is constantly driving them there, and that is the pus-soaked cementum.

A cordial vote of thanks was extended to the essayist for his interesting paper.

Adjournment.

WILLIAM J. LEDERER, D.D.S.,
Editor, First District Dental Society.

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EDITORIAL DEPARTMENT

OUR DUTY TO-DAY

Every self-respecting American to-day is asking himself the question: How may I best serve my country? We are entering a war which is to decide the spiritual destiny of the human race. To no nobler cause may we dedicate our every effort and sacrifice. At such a time there are things dearer to the soul of man than bodily comfort, personal security, or life itself. There are millions of plain, undistinguished men and women in our broad land ready to prove this simple fact.

The business of this war is to be carried to a finish by our fighting men and those who produce and conserve our resources.

The service of the fighting man is of immediate and supreme importance—and to him is due that honor which is won by the highest sacrifice to duty. But, if we are to succeed, many hundreds of thousands of valiant men and women must labor and carry burdens in ways less glorious. Those who keep the family and the Nation together—who produce, conserve, and pay the bills—are performing essential duties which demand very often the highest moral steadfastness. Whether it be the lot of the individual to help fight our battles, or to serve in another field in which he is specially qualified, there is work—serious, important, honorable work—in abundance, ahead of everyone.

The service of the medical man in war has ever been unique and noble. Friend and foe alike receive the blessings of his skill in their sufferings. With every other science trained upon the taking of human life, medicine alone is wholly devoted to the saving of life. In the present war, the dentist has taken his natural place in the medical field. The dentist to-day is a necessary factor in the personnel of a well-equipped fighting force.

In the making of an army of 2,000,000 men, as contemplated by the recent conscription law, there will be needed, in the near future, at a conservative estimate, 2,000 dentists. Here is a splendid opportunity for our profession to contribute special knowledge and skill for the country's good. The older men, and those directly responsible for families, will find many other ways to be of service—in administrative or clinical work in caring for recruits, in helping to care for the patients of dentists who have gone into the Service, in forwarding educational work at home—thereby advancing our science for the good of all. We hope that the excellent purposes of the Preparedness League of American Dentists will be realized by enthusiastic support in all our big cities. Our readers are referred to *THE JOURNAL'S* new department, *OUR ARMY AND NAVY*, in which authoritative information is given concerning requirements for entrance of dentists into the National Service.

Finally, and of far-reaching importance, is the opportunity open to every dentist in active practice in this country, to buy a Liberty Bond.

PROFESSIONAL JOURNALISM—CONTRA

We are indebted to Dr. Hyatt, in the leading article of this issue of *THE JOURNAL*, for his candid and forceful expression of opinions concerning a recent article by Dr. Gies' on the subject of dental journalism. Dr. Hyatt responded to the personal invitation of the editor in preparing this article. With a view to the open debate of an important topic, he does not mince matters—and that is the simplest way to get at the truth of anything. We recommend to those interested a reperusal of Dr. Gies' article, with a view to the comments by Dr. Hyatt.

Dr. Hyatt complains of an obscurity of meaning in many of Dr. Gies' questions; but it may fairly be asked just where Dr. Hyatt stands in the whole question of dental journalism. He expresses enthusiastic approval of "our owning, supporting and publishing our own journals"—and is willing to contribute \$100 a year for ten years towards the consummation of that object. Then he states, in effect, that so long as a supply house journal refrains from "writing up" commercial products in its literary section, "such a journal is, I maintain, a professional journal in the broadest, and most liberal sense, absolutely regardless as to who pays the printers' bills and whether there is a loss or profit in the financial management." Since the prominent and well edited supply house journals are eminently worth while, financially, for their proprietors (we all credit them with the good business sense to be sure of that fact) and further, since such a journal can afford to publish at a minimum cost to the dental profession—then why, it seems proper to ask, should anyone waste good enthusiasm, self-sacrificing effort, and \$100 a year on a journal maintained on its own bottom?

Dr. Hyatt states "It cannot be conceded that trade interests and professional purposes ever conflict." He then quotes, as expressing "not only my sentiments but also . . . the truth in regard to this whole subject," the concluding paragraph of our editorial in the December issue of this *JOURNAL*, in which we declare our position, as clearly as our ability permits, against the "mingling of interests," commercial and professional—which we

¹ W. J. Gies: *Independent Journalism versus Trade Journalism in Dentistry*, *JOURNAL A. D. S.*, XI, Dec., 1916, p. 577.

believe is emasculating the dental profession. It would be interesting to know which of these diametrically opposite views is the one by which Dr. Hyatt abides.

Dr. Hyatt believes the position of the publishers of scientific books to be identical with that of the producer of dental or medical supplies. There is this important difference: the publisher produces the scientific work of the best minds in the *dental or medical professions*: the supply house manufactures articles for the use of dentists or physicians contrived and perfected by trade experts. The publisher of books is wholly removed from the atmosphere of daily *supplies*.

In regard to the acceptance of advertisements, we regret Dr. Hyatt's hasty statement that he "does not believe" that the editorial management of this JOURNAL investigates articles or preparations offered for space in our advertising department. Had Dr. Hyatt taken the trouble to inquire, he would have been informed that a committee passes on all advertisements, and when in its judgment an article or preparation fails in its advertised claims, such an advertisement is declined further publication.

Dr. Hyatt takes very seriously Dr. Gies' jocular reference to the staff surmounted by eagle's wings, by which he outlines the *impression* made upon him by a symbolic device on the cover of a house journal, and Dr. Hyatt marvels that Gies does not know its emblematic signification. We are glad to assure him of our strong belief that Dr. Gies is familiar with the sign of Æsculapius—also that he would know the American Eagle, Neptune's Trident and the Signs of the Zodiac. Had Dr. Gies been the originator of the famous phrase "twist the tail of the British Lion" we can imagine Dr. Hyatt's haste in correcting him: "Yes—but you can't do that, you know: there *is* no British Lion, really—he's only an emblem, and you can't twist the tail of an *emblem*!"

The most serious charge brought against Dr. Gies is that of casting a slur upon the dental profession, in asking whether dentists in their attitude of indifference concerning dental journalism are lacking in self-respect. Dr. Hyatt declares that it will little avail Dr. Gies to refute or repudiate the implication conveyed by this question, and he takes the editorial staff of

this JOURNAL to task for publishing "through an oversight," "this attack upon the profession."

In view of this arraignment, it is indeed remarkable that Dr. Hyatt should close his paper in the following way:

With the alteration of one word, I wish to conclude these comments by quoting in full one paragraph from the editorial in the December number of this magazine, and which not only expresses my sentiments, but also expresses the truth in regard to this whole subject.

"Just here, however, it is only fair to confess that 'all' of the fault lies on our side. How many dentists, taken by and large, give any serious thought to this matter? How many care what the activities of the commercial concerns may be? How many dentists at this date would make any serious sacrifice to establish and safeguard an untrammelled professional journalism? Our reforms must begin at home. We cannot expect the trade houses to abandon their highly profitable 'mingling of interests' while we remain not only indifferent, but willing by voice and act to coöperate with them. If, as practitioners of a specialty in medicine, we hope to fill responsibly our place in a great and learned profession, we must adjust our lives to the spirit of that high calling, and by unmistakable action, banish even the suspicion of divided motives."

Dr. Gies asks the question, whether or no, in regard to ideals concerning the production of our literature, dentists are lacking in self-respect. We have stated in the original version of the above paragraph that "much" of the fault, in our unenviable position to-day, lies with us. Dr. Hyatt echoes that sentiment, changing the word "much" to read "all." If honest, adverse criticism constitutes a "slur" in this case, then to Dr. Hyatt we must accord the palm for having "slurred" his profession most unqualifiedly, comprehensively and effectively. But we do not admit the premises. Dr. Hyatt and hundreds of other intelligent men know we need this bitter medicine—that a wholesome corrective is needed to sweep away the inertia and the complacency which in these days retard our growth in matters above and beyond the problems of the day's work.

CURRENT DENTAL LITERATURE

COMPILED BY ARTHUR H. MERRITT, D.D.S.

Titles marked with an asterisk (*) are abstracted briefly.

Boston Medical and Surgical Journal, January 18th, 1917.

23* An Anatomical Factor as a Cause of Pyorrhea. By C. M. Cobb.

24* Orthodontia in Medicine. Editorial.

23 An Anatomical Factor as a Cause of Pyorrhea.

It is the writer's opinion that local malnutrition, producing as it does lowered resistance, is an important factor in causing pyorrhea, and that no treatment can be wholly successful which does not include vigorous stimulation of the gums. Attention is called to the terminal nature of the circulation in the investing tissues of the teeth, as a result of which they are more susceptible to nutritional disturbances. Vigorous use of the teeth in mastication and efficient brushing of the gums with the tooth brush is advocated.

24 Orthodontia in Medicine.

Attention is called to the important place which orthodontia has taken in the correction of certain conditions which had hitherto seemed irremedial. Not only does orthodontic treatment change the facial outlines, but at the same time it greatly improves the mental and physical well-being of the patient. Lack of development of the maxillary bones, especially the superior maxillae, not only causes malocclusion of the teeth, but produces a narrowing of the entire nasal and nasopharyngeal cavities. Too often this condition is confounded with stenosis, due to adenoids or other nasal obstructions. Improvement in breathing and in the general and mental condition of the child is perhaps more marked following orthodontic treatment than after the removal of adenoid obstructions.

Dental Cosmos, April 1917.

25* Electro-Sterilization of Root Canals. By H. Prinz.

26 The Management of Pyorrhea. By P. R. Stillman.

27 A Study of the Lymphatic Vessel of the Dental Pulp. By K. Dewey and F. B. Noyes.

25 Electro-Sterilization of Root Canals.

It is asserted that the surfaces of an infected root may be completely sterilized to the depth of a few millimeters by the use of a 1 per cent. sodium chlorid solution and a weak current (30 to 40 volts) with low amperage (0 to 5.) Free chlorin is produced and to a less extent, hydrochloric acid. In practice, the degree of concentration of the solution to be ionized has no effect on the quantity of ions produced. Silver and copper as ions, are the only metals which possess (and that only to a limited extent) a germicidal action; their ions discolor

tooth structure. A zinc electrode is not ionized by an electric current in the presence of a 1 per cent. sodium chlorid solution at the low amperage employed in the sterilization of root canals. If zinc chlorid is substituted for sodium chlorid, zinc ions are produced but are devoid of supposed germicidal properties.

The Dental Review, April 1917.

28 A Developing Profession—How Shall We Meet the Opportunities and Responsibilities of the New Future. Edmund Noyes.

A method of root canal filling advocated by the Author and approved of by several who discussed his paper is as follows: the canal is made ready and moistened by eucalyptol, a plugger chosen that will go as near to the end of the canal as practicable to which a small cone of Hill stopping is attached and made plastic as possible over the flame. The plugger is then heated until it shows red, the point is dipped in eucalyptol and carried as far into the canal as may be with a churning motion. This is followed by a Donaldson roughened broach which previous trial has shown will go to end of canal; this is dipped in eucalyptol and the small portion of the root filling is churned until it is fully plastic and carried to end. Subsequent portions of the filling are made plastic with heat and churned in with the hot instrument, an effort being made to obtain plasticity as much by heat and as little by the solvent as is practicable. Regarding roots which roentgenograms show are not filled to the end, those in which the unfilled canal can be seen, should be reopened and refilled. Where the canal is not visible, the advisability of reopening such roots should be carefully considered in cases where there is no evidence of infection, inasmuch as it may be impossible to improve conditions.

Journal of the American Medical Association, January 20, 1917.

29* Ankylosis of the Jaws. By C. J. Lyons.

30* Blastomycosis of the Tongue. By G. B. New.

31* A New Operative Procedure Facilitating the Adaptation of Artificial Dentures. By H. A. Potts.

29 Ankylosis of the Jaws.

The predisposing age of true ankylosis is the first ten years of life, the most common causes being trauma and infection. Diseases frequently associated with it as etiological factors are scarlet fever, otitis media, alveolar abscesses, diphtheria, etc. Its development is slow, several years often being required in the production of lesions of any extent. The general health is usually little impaired. Digestive disturbances are, however, not uncommon, due probably to imperfect mastication. In the changes which take place in the temporo-mandibular articulation, whether from trauma or infections, there is a marked susceptibility to metaplasia, with the result that the normal structure may become obliterated with the formation of new tissue. Marked deformity usually results, due in part to atrophy from disuse of all the

tissues of the lower jaw. The diagnosis is not difficult as in bony ankylosis as there is no lateral movement of the mandible. Treatment consists in removing a section of the bone from the condyle—an operation comparatively free from serious complications. Mastication begins in about two weeks after operation, and is followed by improvement in the patient's health and appearance.

30 Blastomycosis of the Tongue.

The Author reports a case presenting at the Mayo Clinic in which this disease (usually regarded as a skin lesion) was seen in the form of a nodular tumor at the base of the tongue filling the entire pharynx. It was firm, but did not have the hardness of malignancy. In appearance there were rounded folds between which were grayish-white areas. Diagnosis was made by the presence of blastomycetes with secondary lymphoid hyperplasia of the tissues of the tongue. Treatment consisted in the administration of potassium iodid, beginning with 10 drops three times a day and increased 2 drops daily until 125 drops were being taken thrice daily. Radium treatment was also given, and the tumor swabbed daily with iodine. Complete recovery followed.

31 A New Operative Procedure Facilitating the Adaptation of Artificial Dentures.

In cases of marked protrusion of the alveolar process in edentulous jaws, the Author advises surgical interference. By removal of a portion of the gum tissue over the area to be operated upon, the bone is exposed. This is removed by means of rongeur forceps and large bone burs. The overlying soft tissues are then brought into apposition and sutured with horsehair. The results obtained, make possible much more satisfactory restorations.

Journal of the American Medical Association, February 3, 1917.

32 Ipecac and Dysentery.

Editorial.

Ipecac, a root of a Brazilian herb, was introduced into Europe about 1650, at which time it was used as a cure for dysentery. In 1907, its alkaloid, emetin was first isolated from ipecac, and in 1910, Vedder demonstrated its effectiveness as an amebicide, even in highly dilute solutions. Regarding its use in the treatment of pyorrhea, this writer says—"As a direct cure for pyorrhea, it seems to have failed, not because it does not act on the amebas which are found in the pyorrhea pockets, but because pyorrhea is not caused by amebas, as asserted by some prematurely."

Journal of the American Medical Association, February 10, 1917.

33 Bacterial Findings and Their Relationship to Pyorrhea Alveolaris. By A. W. Lescohier.

34 The Roentgen Ray in the Diagnosis of Pyorrhea. By H. E. Potter.

35 The Importance of a Correct Differential Diagnosis of the Predisposing Causes in Cases of Pyorrhea Alveolaris. By M. L. Rhein.

36 Some Studies in the Treatment of Pyorrhea Alveolaris. By G. B. Harris.

37* The Etiology and Treatment of Interstitial Gingivitis. E. S. Talbot.

37 The Etiology and Treatment of Interstitial Gingivitis.

The Author gives as the causes of pyorrhea, the end-organ nature of the tissues involved, their susceptibility to impaired nutrition; local and constitutional irritants and chemical changes in the blood due to a low form of inflammation and bone absorption, and to nerve end degeneration and arteriosclerosis. Local treatment consists in the application of iodine to the gums, removal of irritants and free bleeding of gums.

Journal of the American Medical Association, February 17, 1917.

38 Mouth Sepsis.

J. M. Anders.

The opinion is expressed that in cases of systemic infection in which the teeth are suspected, the accessory sinuses should first be eliminated as possible causes before referring the patient to the dentist. Successful treatment of secondary systemic infections demands first of all the removal of the septic focus or foci on which they depend. Before extracting the suspected teeth, the necessity for doing so should be as convincing as possible and should not be resorted to until after their treatment had proved ineffectual. The Author deprecates the rapidly growing custom of sacrificing teeth, many of which are merely suspected of being septic, a custom which cannot fail to arouse the most ardent activity of dentists in opposition thereto, and which must prove the ultimate chagrin of the medical profession. He says—"It would appear that an amazingly low estimate is being placed on the value of human teeth by an increasing number of physicians, who should appreciate the importance of a good masticating apparatus to the digestive function—to the maintenance of health."

Medical Record, February 24, 1917.

39 The Tonsils and Diseases of the Arthritic Group.

Editorial.

Attention is called to investigations carried on at Johns Hopkins, with a view to determining among other things, the possible relationship of tonsillar and naso-pharyngeal infections to diseases of the arthritic group. Nine cases of rheumatoid arthritis in which there seemed to be no doubt that the tonsil was the source of infection, were subjected to a tonsillectomy, and the results carefully studied. Two showed improvement, two were unimproved, and five became progressively worse. The conclusions drawn by the investigators were that only in exceptional circumstances should a patient suffering from rheumatoid arthritis be subjected to an operation for the removal of the tonsils. The fact is emphasized that a tonsillectomy is one of the most trying of surgical procedures, bad enough when ether is employed and much worse under local anesthesia. Even in cases which give a history of repeated attacks of tonsillitis, it is doubtful whether it is justifiable to subject the patient to an operation. Doubt is also expressed as to the efficacy of tonsillectomy for the relief of or cure

of other affections of a rheumatic nature. It is necessary to observe all general measures that will tend to increase the patient's resistance. When the tonsils are the primary focus of infection, their removal may favorably influence prognosis. See also JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, March 17, 1917, page 851.

New York Medical Journal, February 10, 1917.

40 The Vicious Circle in Oral Sepsis.

N. B. Potter.

A list of over thirty diseases is given in which oral sepsis may be regarded as a considerable or paramount etiological factor, which after an experience of ten years by the Author in the study of such cases, continues to grow. Most often the disease was due to infection by one of the streptococci, generally the viridans. Attempts were made to confirm relationship between streptococci and disease, by means of a complement fixation reaction but without brilliant results. A dozen cases from practice are reported showing the many sided clinical problems which they present, the possibility of there being two or more sources of infection, the difficulty of judging the proper sequence of attacking the vicious circle, and finally, that with patience, adequate general treatment and coöperation from skilled associates, eventual cures or marked improvement result in many instances.

New York Medical Journal, March 10, 1917.

41 Oral Sepsis: A Note of Warning with Regards to its Treatment.

J. M. Anders.

Deprecating the practice on the part of many physicians to advise the indiscriminate extraction of teeth in cases of suspected infection, the statement is made that extraction should never be practiced without reliable scientific evidence that such a course is necessary. Physicians are advised, before peremptorily recommending the extraction of teeth, to consult with a qualified dentist. The opinion is expressed that it is a false and dangerous doctrine to ignore or undervalue the importance of normal mastication.

New York Medical Journal, March 17, 1917.

42* The Saliva in Diabetics. By L. N. Boston and L. W. Kohn.

43* Prevention and Treatment of Cancer Based Upon X-Ray Findings of Dental Infection and the Use of an Autogenous Vaccine. By S. Tousey.

42 The Saliva in Diabetics.

The relationship between the diabetic organism and carbohydrate foodstuffs during metabolism, suggested to the Authors a study of the digestive functions in diabetes, especially the salivary secretions, inasmuch as the latter are the first potent factors in carbohydrate digestion. The salivas of twelve diabetic adults were subjected to study and found as a whole to possess a higher diastatic power than saliva in normal persons, though it is doubtful whether this is a constant factor. They were unable to trace any definite relationship between

the diastatic energy of the saliva and the quantity of sugar in the urine. Nor was there any marked difference in the degree of acidity. Nearly all salivas examined (normal and diabetic) were feebly acid in reaction.

43 Prevention and Treatment of Cancer Based Upon X-Ray Findings of Dental Infections and the Use of an Autogenous Vaccine.

A wide experience with dental abscesses as the foci in many systemic infections of an inveterate type has led the Author to believe that if cancer is due to infections, the teeth afford the most favorable nidus. The most dangerous dental infections are those which give no local symptoms. Their insignificance bears no relation to the magnitude and gravity of the secondary lesions which they may produce. The Author's observations show severe dental infections in all cancer patients so far examined. While it is not supposed that every case of dental infection leads to cancer, the early discovery and eradication of all such infections will doubtless prevent cancer of the stomach and gall-bladder, and possibly many cancers of other internal and external organs. The existence of severe dental infections in cases of cancer of the breast is not to be lightly regarded as a coincidence, when the same sort of infection has been proven to be causative of cancer of the stomach. The sooner the dental foci are eradicated, the better the chances of success with operation combined with x-ray and radium. An autogenous vaccine is frequently indicated.

New York Medical Journal, March 24, 1917.

44 Pyorrhea Alveolaris; Etiology, Pathology and Treatment.

A. H. Merritt.

This article (prepared by request of the editors) is designed to furnish in brief, the best present day knowledge regarding pyorrhea and its treatment. The disease is defined as a progressive resorption of the alveolar process and pericementum, with a coincident recession of the gums and the formation of pockets. The infection of these pockets is secondary. The organisms most commonly found are spirochetes, cocci and fusiform bacilli. These are also found in normal mouths, as are amebas. There is no proof that the disease is caused by either. The predisposing and exciting causes are given as certain systemic diseases, heredity, nutritional disturbances of the investing tissues of the teeth, malocclusion, gingival irritation, etc. It is not by any one of these, but by a combination of them that pyorrhea is caused. Treatment consists in a careful examination of each case to ascertain its individual causes. This involves a consideration of possible systemic complications, the correction of occlusion, the removal of gingival irritation, and the establishment and maintenance of a high standard of mouth hygiene, including vigorous brushing of

the gums. While the omission of any link in this chain would spell failure, the most important and the most difficult to achieve is the removal of irritants upon the affected roots. This means not only the removal of all calcareous deposits by instrumentation, but the complete removal of the necrotic pericementum thereby permitting the living cells of the cementum to lie in physiological contact with those of the surrounding soft tissues. When this is properly done, reattachment takes place, pockets are obliterated, new bone is deposited about the roots as shown by roentgenograms, the teeth become firm and health is re-established in these tissues. Only such results can be regarded as a cure.

New York State Journal of Medicine, February 1917.

- 45 The Effect of Malformation and Infection of the Oral Cavity of the Child Upon Its Future Health. By Stephen Palmer.

Pacific Dental Gazette, February 1917.

- 46 Syphilis; In Whom Should We Suspect its Presence.

G. O. Jarvis.

Regarding the value of the Wasserman test in hereditary syphilis, the Author states that it is by no means to be relied upon as conclusive evidence for or against syphilis, though a clearly positive reaction may well be considered sufficient evidence of lues. Probably not more than 60 per cent. of cases of hereditary syphilis give a positive Wasserman reaction.

NOTES ON DENTAL PRACTICE

COMPILED BY WILLIAM D. TRACY, D.D.S.

Apical Resection.—There are perhaps three classes of cases where apical resection is indicated:

1. Abscessed teeth that will not respond to treatment, generally caused by necrosis of the periosteum of the apical area, the extent of the necrosis generally depending upon the length of time that the abscess has been there.

2. Where root canals have been filled, but improperly so, the filling not reaching the apex of root canal.

3. Root canals where broaches have been broken off in the apical third of the tooth, which precludes the possibility of properly cleansing and filling the canals of the teeth.—W. J. R. AKEROYD, *The American Dentist*.

Attention Paid to Dental Pathology.—With the development of the bacteriology of dental conditions an increasingly great amount of attention is being paid to dental pathology and actual dental treatment. While the medical profession is not capable of applying dental needs, and does not so desire, it is usually in a position to see the conditions first and to observe the baneful general effects upon the system of diseased teeth and their appendages. It can be seen, therefore, what good results would accrue from a closer coöperation between the two professions.—*Editorial, New York Medical Journal*.

Suggestions for Prophylactic Procedure.—Regard the individual tooth as the unit; begin, for example, on the right upper third molar as the first round in the ladder, examine the gingivae and all surfaces of each tooth in its turn. The gingiva for gum lesions and the crown portion for rough surfaces. Every surface except the occlusal should be smooth. Plane the roughness on the tooth crown surfaces, such as cavities, projecting margins of fillings, bands, enamel ridges due to faulty development, improper use of tooth brush, etc. Restore all lost contact points where teeth are found out of line of the normal arch. Move them to proper positions. Orthodontia is only prophylaxis plus a marked degree of esthetics.—C. M. McCAULEY, *The American Dentist*.

Relation of Diet to Sound Teeth.—The effect of diet on the teeth is often overlooked by the physician in outlining a dietary. Too much soft food, especially starches and carbohydrates, tends to help decay, with later impairment of mastication. It is a good rule to insist on the daily use of some hard foods, especially with children, in order to strengthen the jaw muscles and help the teeth develop, as well as keep them clean. Fresh fruits and vegetables, hard crackers, and bacon rind are valuable

for this purpose. Their preparation is a simple matter and, once started, their habitual use is easy.—*New York Medical Journal*.

Limitations of Pressure Anesthesia.—The use of cocain pressure anesthesia, without regard to the presence of infection in the pulp, must be condemned as a dangerous empiricism. The forcing of blood contaminated by bacteria and their products into the periapical structures in the endeavor to anesthetize the pulp results in some of the peridental difficulties which dentists and physicians alike are endeavoring to prevent. The field for cocain pressure anesthesia is limited, and its misapplication may result in a chronic focus of infection with all its attendant complications.—*Pacific Dental Gazette*.

The Influence of Diseased Teeth on General Health.—Without citing cases, I may state that in several patients alveolar abscesses have been found to be the cause of spasmodic asthma. One lady attributes her freedom from asthma to the removal of badly infected teeth followed by the use of autogenous vaccines made from the pus. Certainly it is quite reasonable to conclude that an alveolar abscess may be the focus from which is absorbed the foreign bacterial protein causing the anaphylactic phenomenon known as spasmodic asthma.—ROBERT H. BABCOCK, *New York Medical Journal*.

Caution to Be Used While Working on Teeth While Anesthetized.—A very important and probable factor where death of pulps has occurred following infiltration anesthesia is the injury caused by overheating with stone or bur. Though the tooth under anesthesia be insensitive to grinding, it should not be subjected to prolonged friction. A stream of water should be directed into the cavity during excavation.—S. L. SILVERMAN, *Dental Register*.

X-Ray in Dental Diagnosis.—A putrescent mass in the pulp chamber of a tooth may exist for months or years, because the walls of the cavity cannot collapse and are incapable of throwing out granulations and eventually filling the cavity with healthy tissue, like the natural process of cure in an abscess in the soft tissues of the body. This putrescent mass may constantly poison the bony tissues surrounding the apical foramen sufficiently to produce an effect clearly recognizable in a radiograph. This condition may be unknown to the patient, and sometimes may not reveal itself to the usual tests applied by the dentist. From this long persisting source of infection, secondary lesions and symptoms of the gravest and most diversified character may arise. The X-ray is to be depended upon to show whether or not the source of trouble is connected with the teeth or the pneumatic sinuses, and if so, whether the trouble is due to malposition and unnatural pressure or to infection. It would be a mistake to regard every case as due to the teeth and proceed to sacrifice the latter without first making roentgenograms, which may acquit them of any complicity in the matter.—SINCLAIR TOUSEY, *New York Medical Journal*.

Interpretation of Roentgenograms.—The reading of a roentgenogram depends upon the difference in density of the various tissues. Enamel, which is dense, will appear a very light gray, while the living pulp tissue will be a very dark gray. Lack of tissue or density will appear very black, while gold crowns and filling material will appear very white. Thus, a good radiograph should possess good whites and blacks and intermediate tones of gray. The presence of small, round amalgam fillings on the buccal and lingual surfaces should be noted, as these are likely to appear as small pulp stones in the pulp chamber.

After two and a half years' experience in doing X-ray work I feel that I can state with safety that the average abscess cavity or deficient root canal filling is very evident in the negative, and the diagnosis is very simple. However, there are cases that are extremely difficult to read, and the writer can only suggest the careful taking into account of the clinical symptoms and in the event of failing to reach a satisfactory diagnosis referring the case to a specialist or radio-dentist.—A. H. GUNN, *Oral Hygiene*.

Nitrate of Silver in Adjusting Gold Plates.—Tissue necrosis caused by undue pressure from a gold plate at a given point is readily corrected by cauterizing the wound with crystal argentic nitrate. The plate is replaced in the mouth and allowed to remain for a few minutes. When removed the plate will be found to have oxidized at the point of contact with the silver nitrate. Grind away this spot and thus relieve the pressure. The silver nitrate has thus performed a two-fold duty, *i. e.*, as a medicament to the wound and by oxidation acts as an index to the point where the plate binds.—H. J. KAUFFER.

Dakin's Solution in Dentistry.—I wish to call attention of the dentist to Dakin's Solution. This wonderful antiseptic, which has revolutionized the treatment of wounds in the war hospitals of France and England, first suggested by Dr. H. D. Dakin, of the Rockefeller Institute, is just as invaluable in dental practice as it is to the general surgeons. In dental surgery for post operative irrigations and dressings, for irrigating pyorrhea pockets and sterilizing root canals it has no equal. I say this after several months' trial.

Formula for Dakin's Solution: Chlorid of lime, grams 200
Soda carbonate, " 100
Soda bicarbonate, " 80
Aqua pura, liters 10

Allow to stand over night and filter through cotton. This makes a little over 21 pints. Does not deteriorate by standing.

In treating root canals, after the canal is well opened through the apex irrigate with Dakin's solution and seal a Gillett absorbent point, wet with the solution, in the canal for several days. This is done with the rubber dam in place; repeat as often as indicated. To determine sterility,

introduce a Gillett point well into canal, then saturate with a sterile saline solution by means of hypodermic syringe; then take up surplus moisture with sterile cotton, seal and allow to remain for one week. Any organisms near the apex will be drawn in by capillary attraction and found upon the Gillett point. This point is then put in bouillon culture and incubated for 48 hours. If at the end of this time the bouillon is sterile, the root canal can be filled with a reasonable assurance of safety. If the bouillon is contaminated, further treatment or extraction is indicated. Personally, I am persuaded by the character of the organism as to my conclusion.

Dakin's solution sterilizes by liberating chlorin, which has strong antiseptic properties, and by irritation induces hyperemia. I mentioned some time ago in this magazine that hyperemia, to my mind, was the most potent agent in ionization. I am gratified to observe other investigators recognizing this fact. With Dakin's solution we get both chlorin and hyperemia, and so the patient does his ionization at home instead of in the dental chair, if I may put it that way.—H. J. KAUFFER.

Oral Foci of Infection.—The removal of oral foci of infection is frequently followed by a rapid return of vital resistive power to the individual, which resistive power may be accelerated by the addition of autogenous vaccine treatment in cases where physicians deem it advisable to bring about a more rapid change to the normal and removal of any low grade secondary general infective process. It is a wise precaution in treating these infectious foci, when present in connection with other bodily disturbances, to preserve a live culture of the organisms, pending the determination whether a vaccine is to be made or not, as after the focus is removed it is too late to procure a serviceable culture. To procure original culture material for such vaccines, the methods employed must be very carefully carried out in the most up-to-date and thoroughly scientific manner.—H. H. SCHUMANN, *Chicago, Ill.*

Pulp Conservation.—Even though I were convinced that I might be wrong in my contention that the pulp plays an important part in the nourishment of a mature tooth, I would still advocate its preservation, if possible, because of the uncertainty of perfect pulp canal treatment. The X-ray may show that a root is normal and contains no tortuous canal or canals, but it may not show constrictions in a canal, multiple apical foramina or minute branching canals, and will seldom show a clear picture of all the roots of an upper molar. For these reasons and because of the danger of imperfect cleansing of constricted or tortuous canals the danger of breakage of fine instruments, the possibility of leaving fragments of pulp in branching canals or in roots with multiple apical foramina, the danger of infection and the difficulty of perfectly sealing root canals, I still believe that pulp conservation, when possible, is the proper method of procedure.—ALFRED R. STARR, *Dental Items of Interest.*

CURRENT NEWS

Upon the nomination of President Butler, the trustees of Columbia University have appointed the following persons to serve as members of the Administrative Board of the School of Dentistry for three years, from July 1, 1917:

JAMES C. EGBERT, Ph.D., Chairman,
Director of Extension Teaching.
SAMUEL W. LAMBERT, M.D.,
Dean of the Medical Faculty.
WILLIAM J. GIES, Ph.D., Secretary,
Professor of Biological Chemistry.
HANS LINSSER, M.D.,
Professor of Bacteriology.
FRANCES CARTER WOOD, M.D.,
Director of Cancer Research.
DR. HENRY W. GILLET.
DR. HENRY S. DUNNING.

This Board will control the general policies of the Undergraduate and Postgraduate Schools of Dentistry and of The School of Oral Hygiene. These three institutions are now merged as one school under the department of Extension Teaching, pending their permanent organization.

* * * * *

The following is from a letter of recent date to the editor of Current News and should prove of interest to all loyal graduates of Harvard University Dental School:

"A committee, consisting of the Administrative Board, twenty members from the Alumni Association, five from the Odontological Society, and three at large, have been considering plans for the proper celebration of the fiftieth anniversary of the founding of the Harvard Dental School. The plans, as they are now worked out, are as follows:

"The celebration is to occupy three days, Friday, November 9, Saturday, November 10, and Sunday, November 11.

"On Friday there will be a historical address in an amphitheatre of the Medical School, followed by a tea, and the orthodontia clinic at the Dental School, where an exhibit of a historical character will be set up. The admission to these functions will be by invitations to be sent out by the alumni to their patients and friends. On Saturday morning there will be clinics of merit, by men of national reputation, at the school. The afternoon will be given to some form of entertainment for guests and clinicians, with a banquet in the evening, for alumni, ladies, clinicians and guests. Sunday afternoon there will be a lecture, or lectures, on the broader dental subjects, open to the public."

Beginning in October, 1917, the Trustees of the Forsyth Dental Infirmary for Children, of Boston, Mass., will conduct a training school for Dental Hygienists. The circular of announcement states that the candidates must be eighteen years of age, and must present certificate of graduation from an approved high school or an equivalent of four years high school study.

The course of study covers a period of twelve months, the clinical hours being from 9 A. M. to 5 P. M. The course of lectures and demonstrations given, outside of these hours, embodies the following subjects:

Histology	Oral Pathology
Anatomy	Sterilization and Asepsis
Physiology	Dental Pathology
Bacteriology	Teaching Oral Hygiene to Children
Oral Bacteriology	Oral Surgery
Laryngology	Extracting
Roentgenology	Novocain
Orthodontia	Anesthesia
Investing Tissues of the Teeth	Dental Jurisprudence
Contagious, Infectious and Communicable Diseases	Therapeutics
General and Oral Hygiene	Prosthetic Prophylaxis
Instruments and Technic Work	Dental Materia Medica
Operative Technic	General Organic Chemistry
Clinical Dentistry	Orthopedics
Clinical Prophylaxis	Neurology

"This course offers unusual opportunities to the students of dental hygiene. The facilities of the various clinics and laboratories of the Infirmary are made available and all of the pupils receive thorough and comprehensive training which will fit them to be teachers in public schools and institutions, to operate as dental hygienists in the prophylactic treatment of teeth, and to act as dental nurses in private offices and institutions. They will become thoroughly familiar with the theory of dental practice, with the sterilization and care of instruments, with anesthetics and their administration and with the care of the patient before, during and after their administration; also with operating procedure from a surgical standpoint."

More detailed information can be had by any one interested, by applying to Dr. Harold DeW. Cross, 140 The Fenway, Boston, Mass.

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Three Boston hospitals have completed their organization as military base hospital units, under jurisdiction of the American Red Cross, and have been equipped by the Boston Metropolitan Chapter of the Red Cross. The personnel of these three hospital units contains noted physicians, surgeons, dentists and specialists from in and about Boston.

The dental department of the Peter Bent Brigham Hospital and Harvard Medical School Base Hospital Unit (No. 5) has Dr. William H. Potter as dental surgeon and Dr. Rodger B. Taft as assistant. The Massachusetts General Hospital Base Hospital Unit (No. 6) has Dr. L. M. S. Miner as dental surgeon and Drs. Harold G. Tobey and Chas. W. Ringer as assistants. The Boston City Hospital Base Hospital Unit (No. 7) has chosen as dental surgeons Dr. Ferdinand Brigham and Dr. Frank H. Cushman. These two last named men have seen active service with the British Expeditionary Forces in France as members of the Harvard Surgical Unit.

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With the advent of summer and the warm, sunny weather comes also the pestiferous house fly. We note the special bulletin of the Merchants' Association of New York, headed "Beware of the Dangerous House Fly." The admonitions and suggestions contained should be followed by each and every person of the community. April, May and June are the best months to conduct antily campaigns. Kill at once every fly you can find and burn its body. As the bulletin states: "The killing of one fly now means there will be billions and trillions less next summer." "Clean up your own premises, see and insist that your neighbors do likewise." "Especially clean out-of-the-way places and every nook and cranny." It is definitely known that the fly is the "carrier" of typhoid germs and it is widely believed that it is also the "carrier" of other diseases, including possibly infantile paralysis.

Two recipes of solutions for the destruction of house flies are given: 1st. Add 3 teaspoonfuls of the concentrated formaldehyde solution, known as formalin, to a pint of water. 2nd. Dissolve 3 teaspoonfuls of the pure chemical sodium salicylate to a pint of water. These solutions are not poisonous to children, they are convenient to handle, their dilutions are simple, and they attract flies. Another suggestion, which could nicely be applied in the dental office, is based on the fact that any odor pleasing to man is offensive to the flies and will drive them away. Five cents worth of oil of lavender, mixed with an equal bulk of water, can be put into a common glass atomizer and sprayed around the room. This odor is very disagreeable to flies, but refreshing to most people.

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The Stamford, Conn., Dental Clinic was opened on October 15, 1915, and clinic days (from 3:30 to 5:30 P. M.) were held twice a week until July 1, 1916, when it was closed for the summer. On October 17, 1916, the clinic was reopened and has been conducted along the same lines as previously. During these fourteen months 126 clinic days have been held, and on those days, 637 children have been attended. Number of fillings, 358; number of treatments, 170; number of root-canals filled, 8; number of cleanings, 24; number of extractions, 199.

From the Office of the Collector, Third District of New York, Treasury Department, Internal Revenue Service:

Referring to T. D., 2194, holding that any synthetic substitute for cocaine, alpha or beta eucaine, or their salts or derivatives, comes within the provisions of the Act of December 17, 1914, and that persons using or having in their possession any such synthetic substitute are required to register and obtain such substitutes upon official order forms and otherwise conform to this act, this office has decided to suspend the enforcement of the ruling of April 26, 1915.

This action is taken in view of the decisions of the United States District Court, Southern District of New York, of June 28, 1915, and of the Circuit Court of Appeals for the Second Circuit, of February 21, 1916, holding that these synthetic substitutes did not come within the provisions of section 1 of the act.

MARK EISNER, Collector,
Third District, N. Y.

* * * * *

The newest thing in dental clinics and social service has recently been inaugurated at the Massachusetts School for the Feeble Minded, located at Waverly, Mass. This school has about 1,500 members, and aside from the visits of a dentist for six hours per week, has been without dental aid for a considerable time. To the progressiveness and humanity of Dr. W. E. Fernald, superintendent of the school, belongs the credit for a distinct step in advance. Under the supervision of Dr. A. G. Richburg, ten of the senior students of Tufts College are assigned for work at this clinic. They carry on the work each day for one week, at the end of which time ten more students take up the work for one week. The records, methods of procedures, etc., are along the same lines as at the college. The work consists of general operative dentistry and extraction. Opportunities for research work with regard to the good or ill effect of certain methods of treatment are unlimited and those in charge look forward to interesting results in the near future.

OUR ARMY AND NAVY

The world must be made safe for Democracy!

The world can be made safe only if democracies are willing to fight to make it safe.

Freedom and liberty for oneself and one's posterity are worth fighting for.

Uncle Sam has rolled up his sleeves and pitched into this fight to defend the threatened freedom and liberty of our own beloved country, and to help crush the ambitions of a dynasty which would rule the world by might instead of right.

Our country needs millions of fighting men for the successful prosecution of this war. These millions of men must be kept in fighting trim.

Aching teeth cause loss of sleep, and impairment of the function of mastication. Loss of sleep, continuous pain, and faulty digestion soon takes the fight and "pep" out of even the best soldier.

Abscessed teeth produce pus absorption—pus absorption reduces vitality and resistance.

Reduced vitality and resistance result in—a higher percentage of casualties from wounds,—an increased susceptibility to pneumonia, typhoid, malaria, and all the other diseases which do so much to reduce the number of army effectives.

THE TEETH OF SOLDIERS MUST BE KEPT IN AN EFFICIENT AND HEALTHY CONDITION!

There can be no answer to this argument, and the fact being admitted, who but dentists can carry out this great work?

Not hundreds, but thousands of dentists must be commissioned in the Dental Officers Reserve Corps, first to bring about—and then maintain, the dental efficiency which is so essential to army efficiency.

The character of the dental profession will be weighed and judged by its deeds in this world conflict and we must not be found wanting.

Waiting for the "other fellow" to be commissioned first will not help to win this war.

Merely being over the conscription age does not excuse any dentist from doing his duty.

Being a married man does not excuse any dentist from national service unless he is able to state, after a consultation with his conscience—and an exhaustive consideration of all ways and means, that he is entirely unable to support or arrange to have supported his family in his absence. In your calculations do not forget the \$2,000 which the government pays for your services each year.

Don't talk of your sacrifice! Did you ever hear of a war which did not bring with it heart-rending and body-punishing sacrifices?

Is there any vocation free from sacrifice in this bloody world war? Is there any logical reason why the dental profession should not make sacrifices now that it has been called upon to do so? Is not the service of your country, humanity, and the honor and glory of your chosen profession worth any sacrifice? Is there anything except personal selfishness which you can offer as a reason why you should not enter the service of your country in a dental capacity?

Theodore Roosevelt recently stated that when a doctor of medicine was called to serve his country and his fellow man in distress, he should consider the call a privilege and not a sacrifice.

You are not in a business dedicated to profits and dividends, but in a profession dedicated to serve mankind.

The Surgeon-General's office of the U. S. Army is swamped with pleas for dentists, dentists, and more dentists, and has appealed to the dental profession for support and assistance.

If you are a REAL MAN you will waive all claim to exemption on technicalities which might permit you to be a slacker.

If you are a REAL DENTIST—a true professional man in character and temperament,—you will answer the call of your nation to serve humanity.

If you are a REAL AMERICAN you will become part of the machine which is to fight to make the world safe for Democracy.

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The following information is from the War Department, Washington, D. C. It may prove of value to those who, in their sense of patriotic duty, may desire to affiliate themselves with our National Government in the present crisis.

Appointments in the Dental Reserve Corps of the Army:—

“The National Defense Act of June 3, 1916, and the tentative regulations thereunder, provide for a dental section or branch of the Officers' Reserve Corps. The officers of the Dental Reserve Corps have the rank of first lieutenant, and are appointed and commissioned by the President, after having been found upon examination prescribed by him, physically, mentally and morally qualified to hold such commissions. Commissions are issued for periods of five years, at the end of which time the officers may be recommissioned, subject to such further examinations and qualifications as the President may prescribe. They are subject to call for duty in time of actual or threatened hostilities only. While on active duty under such call, they are entitled to the pay and allowances (including quarters, fuel and light) of their grade. They are entitled also to pension for disability incurred in the line of duty and while in active service. They are not entitled to pay or allowances except when in active service, nor to retirement or retired pay.

“Appointees must be citizens of the United States, between 22 and 55 years of age, must be graduates of standard dental colleges, and must,

at the time of appointment, be in the active practice of their profession in the States in which they reside.

"The examination is physical and professional. It is conducted by boards consisting in each case of one medical and two dental officers of the Army, designated by the War Department.

"The examination as to physical qualifications conforms to the standard required of recruits for the United States Army. Defects of vision resulting from errors of refraction which are not excessive, and which may be entirely corrected by glasses, do not disqualify unless they are due to or are accompanied by organic disease. Minor physical deficiencies may be waived.

"The professional examination will be oral. If the applicant fails therein he may, if he desires, have a written examination. An average of 75 per cent is required to qualify in the examination. The examination comprises the following subjects:

"1. Dental pathology and bacteriology.

"2. Chemistry, physics and metallurgy.

"3. Recent advances in dental surgery and technic.

"Applications for appointment in the Dental Reserve Corps must be made in writing, upon the prescribed blank form, to the Surgeon General of the Army, Washington, D. C., who will supply the blank upon request. The correctness of the statements made in the application must be sworn to by the applicant before a notary public or other official authorized by law to administer oaths. It must be accompanied by testimonials based upon personal acquaintance, from at least two reputable persons, as to the applicant's citizenship, character and habits, and by his personal history given in full upon the blank form furnished him for the purpose."

* * *

Appointments in the United States Naval Reserve Force as Dental Officers: A member must be a citizen of the United States.

A member obligates himself, and may be ordered to serve in the Navy throughout a war or during the existence of a national emergency declared by the President, should either arise during his term of enrollment.

A member enrolls or re-enrolls for a term of four years.

In time of peace, and when no national emergency exists, a member may be discharged upon his own request, upon reimbursing the Government for any clothing gratuity that may have been furnished during his current enrollment.

A member is given a provisional grade (dental surgeon) upon first enrollment in accordance with his qualifications determined by examination.

A member after enrolling may, in time of peace, upon his own request, be assigned active duty in the Navy for such periods of instruc-

tion and training as may enable him to qualify for and be confirmed in grade.

For confirmation in grade, a member must serve the minimum amount of active service required (three months), and must qualify by examination under regulations prescribed by the Secretary of the Navy.

The minimum active service required for maintaining the efficiency of a member (Naval Coast Defense Reserve) is three months during each term of enrollment. This active service may be in one period or in periods of not less than three weeks each year.

No person shall be appointed or commissioned an officer in any rank in any class of the United States Naval Reserve Force, or promoted to a higher rank therein, unless he shall have been examined and recommended for such appointment, commission, or promotion by a board of three naval officers not below the rank of lieutenant commander, nor until he shall have been found physically qualified by a board of medical officers organized to perform the duties required in time of war.

A member receives retainer pay of \$12 per annum while enrolled in a provisional grade, provided he makes such reports concerning his movements and occupation as may be required by the Secretary of the Navy. After confirmation in grade his annual retainer pay is two months' base pay of the corresponding rank in the Navy. Retainer pay is in addition to any pay to which a member may be entitled by reason of active service.

A member who re-enrolls for a term of four years within four months of expiration of last complete enrollment, and who has performed the minimum amount of active service required during the preceding term of enrollment, for each re-enrollment receives an increase of 25 per cent of his base retainer pay. A member who completes twenty years of service, and who has performed the minimum amount of active service each term of enrollment, on his own application will be retired with rank held, with a cash gratuity equal to the total amount of his retainer pay during his last term of enrollment.

A member is subject to the laws, regulations, and orders for the government of the Regular Navy only during such time as he may by law be required to serve in the Navy in accordance with his obligation, and when on active service at his own request, and when employed in authorized travel to and from such active service in the Navy.

A member actively employed receives the same pay and allowances, gratuities and other emoluments as an officer of the Naval Service on active duty of corresponding rank and of the same length of service. When not actively employed, a member is not entitled to pay, bounty, gratuity, or pension, except as expressly provided by the provisions of the act.

ENROLLMENT

A candidate for enrollment as above must be between 21 and 44

years of age and a citizen of the United States. He must be a graduate of a reputable dental or medical school, legally authorized to confer the degree of doctor of dental surgery.

Examination and form of application is in substance the same as for the Dental Corps of the United States Navy (as published in the *JOURNAL* for December, 1916.) Two exceptions may be noted; one being that in cases of candidates found to be physically disqualified, but otherwise desirable "the examiners may recommend that minor disqualifications or departures from standard be waived and proceed with the professional examination subject to final approval by the department."

Secondly, the professional examination is considerably modified, being primarily: "Oral examination in the several, usual subjects in a standard dental course; to include operative dentistry, prosthetic dentistry and oral hygiene. A practical examination in operative and prosthetic dentistry may be required. Due credit will be given for knowledge and experience in the case of candidates who have specialized in certain branches, and the examination may be modified accordingly."

* * *

The following is the dental section from the recent general staff bill providing for "universal liability to military training and service."

"Section 17. . . . The permanent personnel of the dental corps shall consist of five hundred dental surgeons. Dental surgeons shall have the rank, pay, and allowances of first lieutenants until they have completed five years' service. Dental surgeons of more than nine but less than nineteen years' service shall, subject to such examination as the President may prescribe, have the rank, pay, and allowances of captains. Dental surgeons of more than nineteen years' service shall, subject to such examination as the President may prescribe, have the rank, pay, and allowances of majors."

* * *

An examination of candidates for appointment to the Army Dental Corps will occur on May 7. Another examination will take place on July 2. There are at present fourteen vacancies in the corps, and there will be twenty-two additional vacancies on the first of July.

* * *

Leave for one month is granted First Lieut. Minot E. Scott. S. O. 58, February 28, So. Dept.

* * *

First Lieuts. Richard B. Clark, Terry P. Bull and Donald W. Forbes will proceed to Schofield Barracks for duty. S. O. 28, February 12, H. Dept.

* * *

The advancement from the grade of first lieutenant to that of captain, with rank as captain from June 3, 1916, of the following named dental surgeons is announced: Dental Surgeons Franklin F. Wing,

George L. Mason, Frank H. Wollen, John H. Hess, William H. Chambers, Alden Carpenter, Edwin P. Tignor, John A. McAlister, Jr., George H. Casaday, Julien R. Bernheim, Rex H. Rhoades, George E. Stallman, George I. Gunckel, Frank P. Stone, Raymond E. Ingalls, Harold O. Scott and John R. Ames. W. D., March 28th.

* * *

Leave for one month on surgeon's certificate is granted First Lieut. Harold O. Scott. Upon expiration of this leave Lieut. Scott will report to base hospital No. 2, Fort Bliss, for temporary duty. S. O. 51, February 21, So. Dept.

BOOK REVIEWS

BY C. FRANKLIN MACDONALD, D.M.D.

FOCAL INFECTION. The Lane Medical Lectures by Frank Billings, Sc.D. (Harv.), M.D. 166 pages, 68 illustrations. Cloth, \$2.50. D. Appleton and Co., Publishers, New York, 1917.

The serious dangers to health induced by focal infections, these but recently recognized breeding places for microorganisms and toxins, have become to-day a question of serious moment and earnest study. They are not only of interest to the medical profession, but also to the dental profession, since many potent foci are found connected with diseased oral and head conditions at times centering in the teeth themselves.

This small volume of 166 pages comprises the lectures of Dr. Billings which were delivered in 1915 before the Stanford University Medical School, San Francisco, upon the topic of focal infection. These lectures are based upon studies carried on for the "past twelve or more years at the Rush Medical College in affiliation with the University of Chicago and the Presbyterian Hospital" and "represents the cooperative study of many workers."

The first chapter or lecture takes up the general consideration of focal infection. A focus of infection is defined as a "circumscribed area of tissue infected with pathogenic micro-organisms," which may be primary or secondary, and the author states that "infection of the teeth and jaws, with the especial development of pyorrhea dentalis and alveolar abscess, infection of the faucial and naso-pharyngeal tonsils and of the mastoid, the maxillary and other accessory sinuses, are the most common forms of focal infection." The doctor apparently makes no distinction between alveolar abscess and, as he calls it, "pyorrhea dentalis." He writes, "pyorrhea dentalis and alveolar abscess (Rigg's disease) . . ." and later, under diagnosis of focus of infection, "in alveolar abscess by scaling the accumulated tartar and exudate from the exposed neck of the tooth and by penetrating as deeply as possible into the infected alveolus one may readily obtain material which usually yields endameba buccalis and bacteria." Dental pathologists recognize two distinct conditions under the titles of pyorrhea alveolaris and alveolar abscess. While from the standpoint of focal infection there may be (?) little difference between them, nevertheless it seems quite inaccurate to suggest a common origin and to use the terms interchangeably as the author does.

Lecture number two discusses in some detail the streptococcus-pneumococcus group. It gives the bacteriological evidence of the possible transmutability of the members of this group and the specific tissue affinity which these transmuted forms may acquire. The table showing the elective localization of streptococci is graphic and convincing.

The following two lectures, III and IV, take up in more detail the clinical pictures and findings of the acute and chronic diseases which have been found related to focal infections.

The last chapter is upon treatment. In a general way it draws attention to the basic means for combating the diseases brought about by these foci of infection. "Prevention of focal infection is an important principle in the consideration of the treatment of the etiological factor and the related systemic infections." The recognition of "the importance of pyorrhea alveolaris and alveolar abscess as an etiologic factor in systematic infection" is suggested. After urging the necessity of roentgenograms as a means of recognizing the real morbid and anatomical condition, the lecture "puts it up" to the dentists as follows: "We must look to them for treatment which will destroy the focal infection of the jaws and safeguard the individual from systemic infection. Deplorable as the loss of teeth may be, that misfortune is justified if it is necessary to obliterate the infectious focus which is a continued menace to the general health."

In the treatment of the resulting acute and chronic systemic diseases, the author outlines general procedures, emphasizing the desirability for accurate and exhaustive examination and diagnosis, the removal of all primary and, if necessary, all secondary foci of infection, and the building up of the natural defenses of the body. With regard to serum therapy Dr. Billings states: "Apparently unavoidable anaphylactic shock and other objectionable effects compelled us to abandon its use." As to vaccine therapy the final result was quite as satisfactory without vaccine in patients suffering with chronic infectious arthritis and acute rheumatism. "Patients suffering with chronic streptococcus viridans endocarditis were not benefited by autogenous vaccines." The author deplors the unscientific and empirical use of vaccines, especially the use of stock vaccines advertised as having specific virtues, employed in polyvalent form to insure a "sure-shot" effect. The use of non-specific protein antigens, injected intravenously, is briefly mentioned as offering a fruitful field of research as regards their use in acute and chronic infectious diseases.

The dentist will do well to read this little volume carefully and thoughtfully. It gives in a brief, sane and logical way the present situation with regard to this absorbing topic. It presents without undue exaggeration and the frenzy of the alarmist the known facts of the matter as they stand to-day in the light of modern research. The whole subject is considered from the great general aspect rather than from the individual, specific viewpoint.

MOUTH HYGIENE. A Course of Instruction for Dental Hygienists. A Text-Book Containing the Fundamentals for Prophylactic Operation. Compiled by Alfred C. Fones, D.D.S., Bridgeport, Conn., Edited by Edward C. Kirk, Sc.D., D.D.S., LL.D.; Rob't H. W. Strang, M.D., D.D.S., and Alfred C. Fones, D.D.S. Octavo, 530 pages, with 278 engravings and 7 plates. Cloth, \$5.00 net. Lea & Febiger, Publishers, Philadelphia and New York, 1916.

After considerable discussion and opposition the dental hygienist has become a fact. Their work in the prescribed field of mouth hygiene as it relates to preventive dentistry is becoming everywhere recognized as a valuable adjunct to the welfare of a vast public.

This present book is the direct result of the first school for dental hygienists in the country. It consists of the corrected, condensed, and correlated lectures which were delivered before that first class of thirty-two young women. To glance at the list of contributors, those who gave their time and energy towards an efficient and effective training for these young ladies is impressive. Such names as Anderson, Chittenden, Fisher, Hutchinson, Kirk, McKee, Ottolengui, Rhein, Turner, to take only a few, indicate some of the finest not only in dentistry, but also in medicine.

Realizing that the dental hygienist must have a reasonable knowledge of some of the fundamental facts relative to the human body, this book gives a condensed and graded course of this nature.

First is presented anatomy, divided into two parts, the first of which deals with general anatomy, the structures of organs and the various systems, such as alimentary, respiratory, circulatory, nervous, etc. The second part deals with special anatomy, taking up in more detail the points of interest about the head, especially the mouth and teeth.

A brief sketch of the vast field of physiology is next, and in it is a discussion of digestion, circulation, excretion and the nervous functions.

Bacteriology and sterilization as given by Dr. Rettger are easily understood. The explanation of Ehrlich's side chain theory, difficult to grasp at best, seems too simply and concisely put. The distinction between asepsis, antisepsis and disinfection is made clear, while particular attention is drawn to the value of mechanical cleansing of the operator's hands with soap and brush.

Inflammation, its kinds, sequelae, and the processes of repair and healing is next considered in a brief manner.

After these theoretical discussions the course now enters the field of special endeavor. Dr. Kirk presents the usual and accepted theories of the formation of deposits and accretions upon the teeth and the production of dental caries.

The teeth and jaws as a functioning organ, "a masticating machine," is taken up by Dr. Turner, who discusses in a general way tooth forms, normal occlusion and the processes of mastication. In order that the hygienist may be able to recognize in the young child abnormal tooth relations in the young child the subject of malocclusion is presented in a chapter by Dr. Ottolengui. The Angle classifications of malocclusion are adhered to and examples of such illustrated.

Dr. M. L. Rhein considers the topics of odontalgia and alveolar abscess. He takes occasion to criticize the so-called pyorrhea specialists as follows: "Nearly all of these self-styled specialists begin and end their treatments with the pyorrhea pocket and its environment. Such

men do an incalculable amount of harm." The Doctor seems to wax almost too enthusiastic over the "wonderful diagnostic field" which the gums afford and claims to have "made a diagnosis of many cases of tuberculosis of the lung *simply* from observing the abnormally increased excretion from the mucous follicles." While not in the operative domain of the dental hygienist, the writer has briefly outlined his method for filling root canals as a matter of general knowledge.

The practical consideration of dental prophylaxis is taken up by Dr. Fones. The principles of instrumentation are well described and illustrated by clear photographs. The simplicity of the instrumentarium is to be noted, and also the definite system inaugurated for going over the tooth surfaces. Great stress is laid upon hand polishing, using orange-wood sticks and pumice, as against the use of the dental engine, for the thorough polishing of all surfaces of the teeth. The brushing and flossing of the teeth receives considerable attention, the author presenting as best the rotary motion of brushing and the use of lime water.

Chemistry of food and nutrition, by Dr. Chittenden, is most interesting and written in a way to appeal to the understanding of those not acquainted with the many scientific difficulties of this field of work. The chapter upon dermatology by George McKee is likewise written in a popular way, omitting the greater part of the scientific consideration.

The last few chapters deal with personal hygiene, the value of fresh air and correct posture as related to good health, and suggestions as to teaching and interesting the school children in mouth hygiene.

The final section, by Keyes, Miss O'Neill, and Fones, outlines what has already been accomplished by institutional dentistry in Boston, Cleveland and Bridgeport, even in the short time that such work has been in vogue.

This book should be welcomed by all the dental profession, since it presents a capable and sufficient groundwork upon which to train the dental hygienist. As the schools for dental hygienists continue to increase, as they are sure to do, this volume should find a useful field. To any dentist who cares, possibly, to train his own office assistant, this book gives a very reliable course of study.

OBITUARY

"IN MEMORIAM" RESOLUTIONS

DR. ISADORE LETT

WHEREAS, Our esteemed Fellow, Dr. Isadore Lett, has been removed from us by Divine Providence, it is fitting that we should make a record of his death, and express our sorrow over the untimely close of his career; and

WHEREAS, By his genial disposition, his skill as a practitioner of dentistry, he has been a credit to the profession; therefore be it

Resolved, That we, the Fellows of the American Academy of Dental Science, feeling deeply the loss we have sustained, hereby express our appreciation of his friendship, and our sorrow at his death; and be it further

Resolved, That these resolutions be spread upon our minutes, and that a copy be sent to his widow and his family.

CHARLES M. PROCTOR

JEAN J. LOIZEAUX

KNUT LUTTROPP

NOTICES

AMERICAN MEDICAL ASSOCIATION

The meeting of the American Medical Association will be held in New York City, June 4th-8th, 1917. The following is the program of the Section on Stomatology.

PROGRAM OF THE SECTION ON STOMATOLOGY.

Wednesday, June 6th, 9 A. M.

1. Chairman's Address—Radiographic and Microscopic Studies of the Tissues Involved in Chronic Mouth Infections, Dr. Arthur D. Black, Chicago, Ill.

2. Chronic Diseases of the Mouth, of Interest to both the Physician and the Dentist, Dr. Kurt H. Thoma, Boston, Mass.

3. Cysts of the Dental System, Dr. Kaethe W. Dewy, Chicago, Ill.

4. A Study of the Infectious Granular Tissue Found at the Apices of Pulpless Teeth, Commonly Called Chronic or Blind Abscesses, Dr. Herbert A. Potts, Chicago, Ill.

5. The Relation of Devitalized Teeth Without Danger of Focal Infection, Dr. M. L. Rhein, New York City.

Wednesday, June 6th, 2 P. M.

6. Epithelioma or Cancer of the Mouth, Dr. L. Duncan Bulkley, New York City.

7. Treatment of Cancer of the Mouth by Electrical Cautery, with or without Operative Measures, Dr. J. W. Bransfield, Philadelphia; Dr. G. M. Dorrance, Philadelphia. Discussers: Dr. Albert Ochsner, Chicago, Ill.; Dr. Joseph Bloodgood, Baltimore, Md.

8. Injuries of Temporo-Maxillary Articulation, their Diagnosis and Treatment, Dr. Henry S. Dunning, New York City.

9. Tuberculosis of the Tongue, Dr. John W. Means, Columbus, Ohio; Dr. Jonathan Forman, Columbus, Ohio.

Thursday, June 7th, 9 A. M.

10. Bone Surgery as Applied to the Jaws, with Special Reference to Bone Regeneration, Dr. M. I. Schamberg, New York City.

11. A Composite Osteoplastic Closure of the Clefts of the Hard Palate, Dr. John B. Roberts, Philadelphia.

12. The Use of Soup Bone for the Correction of Deformities or Defects of the Skull and Face, Dr. Wayne W. Babcock, Philadelphia. Discussers: Dr. Allen B. Kanavel, Chicago, Ill.; Dr. Frederick B. Moorehead, Chicago, Ill.; Dr. Geo. V. I. Brown, Milwaukee, Wis.; Dr. Thomas L. Gilmer, Chicago, Ill.

13. A New Operation for the Immediate Surgical Separation of the Superior Maxillary Bones to Widen the Nares for the Improvement of Respiratory and Other Conditions, Dr. Geo. V. I. Brown, Milwaukee, Wis. Discussers: Dr. J. S. Evans, Madison, Wis.; Dr. G. L. Bellis, Wauwatosa, Wis.; Dr. O. H. Foerster, Milwaukee, Wis.; Dr. D. F. MacMillan, Chicago, Ill.

Thursday, June 7th, 2 P. M.

14. War Experiences with Wounds of the Head, Face and Jaws, Dr. Joseph Eastman, Indianapolis. Discussers: Dr. Henry H. Lyle, New York City; Dr. Geo. G. Davis, Chicago, Ill.; Dr. Kellogg Speed, Chicago, Ill.

15. A Preliminary Report of Investigations as to the Frequency of Metastatic Eye Infections from Primary Dental Focii, Dr. Joseph M. Levy, New York City.

All who are interested in the program are invited to be present and take part in the discussions.

ARTHUR D. BLACK, *Chairman.*

EUGENE S. TALBOT, *Secretary.*

* * *

MASSACHUSETTS BOARD OF EXAMINERS

A meeting of the Massachusetts Board of Dental Examiners, for the examination of candidates, will be held in Boston, Mass., June 22 to 30, 1917, inclusive. All applications must be in the hands of the Secretary on or before June 12th. For further information address

GEORGE H. PAYNE, *Secretary,*

29 Commonwealth Ave., Boston, Mass.

* * * * *

NATIONAL DENTAL ASSOCIATION

Railroad Rates. To the twenty-first annual sessions of the National Dental Association, New York City, October 22-26, 1917:

The Trunk Lines, New England and Central Passenger Associations, have granted a rate of two cents per mile in each direction, going and returning via the same route only, limited to midnight of October 30th.

Going tickets in Trunk Line territory will be on sale October 19th, 20th, 21st, at the one way fares, on the certificate plan, these certificates to be endorsed by General Secretary Otto U. King and to be validated by the Special Agent of the railroads who will be in attendance on October 24th-25th-26th. Return tickets to be sold on presentation of validated certificates October 24th to 29th at the difference between the fares paid on the going trip and the fares for the round trip. Return limited to continuous passage to destination and not later than October 30th. This applies on tickets with a minimum of \$1.00 for round trip.

New England Passenger Association tickets to be sold or certificates issued and good going October 19th-20th and 21st and returning not later than October 30th, two cents per mile each direction, shore line mileage, going and returning via the same route only.

Central Passenger Association territory round trip tickets requiring validation at New York City, will be sold on October 19th-20th and 21st with a final return on October 30th, two cents per mile in each direction.

There will be no fee for validation.

COMMITTEE ON TRANSPORTATION,

D. C. BACON, Chairman.

* * *

AMERICAN SOCIETY OF ORTHODONTISTS

CLEVELAND, OHIO, May 1, 1917.

The Annual Meeting of the American Society of Orthodontists will be held at Excelsior Springs, Mo. (30 minute ride from Kansas City), September 5, 6, 7 and 8, 1917.

The program will be one of the best ever presented by the Society.

All those interested in orthodontia are invited to attend.

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1917

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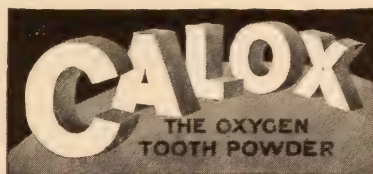
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THE JOURNAL

OF THE

ALLIED DENTAL SOCIETIES

VOL. XII

SEPTEMBER, 1917

No. 3

ADDITIONS TO THE DISCUSSION OF PROFESSIONAL JOURNALISM *VERSUS* SUPPLY-HOUSE JOURNALISM IN DENTISTRY

BY WILLIAM J. GIES

I

LAST December I published in this Journal a paper on "independent journalism versus trade journalism in dentistry."¹ At that time I was conducting research in dental science under the official auspices of the National, New York State, and First District (N. Y.) Dental Societies; was an honorary member of the State and District Dental Societies; was chairman of the executive committee and treasurer of the New York School of Dental Hygiene; and was a member of the Medical Committee and of the finance sub-committee of the Dental Committee, on the organization of the School of Dentistry of Columbia University. I was enjoying these important opportunities to serve dentistry and the public through the courtesy, kindness, and confidence, of dentists and was devoting myself earnestly and, I believed, faithfully to the promotion of dentistry as a profession. I felt the keenest possible personal interest in dentistry as a profession and in dentists as professional men. I assumed that I was regarded amiably as an adopted member of the dental family and would

¹ Gies: *Journal of the Allied Dental Societies*, 1916, xi, p. 577.

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be privileged, by common consent, to do and say, *responsibly*, anything I conceived to be in the interest of dentistry.

I believed that "professional freedom, self-respect, and efficiency, are incompatible with subserviency to trade journalism." I said this frankly and openly at formal dental meetings. On these occasions I was encouraged by dentists to "talk like a member of the family." I had long observed, with concern and regret, the predicament in which dentistry is placed by "the present domination of dental journalism in this country by periodicals issued from, and by, supply-houses." I considered that although I was only an adopted member of the family of dentists, I could perform a grateful service to the dental profession by stating frankly, "without fear or favor," some of the criticisms that appeared to apply to current journalism in dentistry. Realizing the difficulty and danger in the execution of this purpose, however, and appreciating the fact that my effort might do more harm than good, I appealed, at the outset in my discussion, to the earnest and forward-looking men in the profession, through the following preliminary statement of the spirit in which my task was undertaken (p. 583):

"I have spoken frankly, on several public occasions, in criticism of this professionally degrading situation in dentistry. The readers of this JOURNAL know that I have an earnest respect for dentistry as a profession. They have learned, from various statements in papers published in this JOURNAL, of my ardent hopes for the continuously rapid progress of dentistry in effectiveness, usefulness, dignity, and public esteem, as a branch of the great profession of healing and preventing disease. With cordial good-will for dentistry as a profession, and for the hundreds of dentists I have the honor and pleasure to know individually, I now address to the dental profession the following remarks on this unpleasant and dangerous subject, *against a system, not against individuals*. I do so in the conviction that the sincerity of my purpose, and the earnestness of my plea, will protect both purpose and plea from misunderstanding and against *successful* misrepresentation. I do so in the belief, also, that such protests as this, *even if they should have the misfortune to err in details*, will stimulate the discussion and hasten the action, by dentists, that may terminate very soon the dominance of trade journalism over professional journalism in dentistry in this country—and wherever else dental trade journalism may flourish or take root."

Any reading of my paper that might disregard this introductory explanation and appeal, would ignore considerations and

conditions that are essential to a proper evaluation of what was said throughout the rest of the paper.

II

For some time after the publication of the paper, I received, daily, many letters from dentists in all parts of this country and Canada, in cordial general approbation of what had been written. The only letters that were not enthusiastically commendatory were several from a friend of mine and of the editor of one of the leading supply-house journals, who, as a mutual friend, suggested that, if I could do so, I state publicly that this particular editor and his journal were not included in my "indictment" of trade journalism. (See copies of letters in reply, p. 323). My criticism of supply-house journalism having been general and comprehensive, I could not suggest, of course, either privately or publicly, that there had been any exceptions or reservations.

I have seen a few *published* allusions to the paper, in addition to the approbative editorial comment in the issue of the JOURNAL (p. 712) that presented my discussion. I refer below to each of these allusions.²

1. Dr. H. C. Register referred to the contents of the paper with "absolute approval." He said in part:³

"In any disagreement with it (Gies' paper, and the editorial comment on it), or in indifference to it, I see only danger to that higher endeavor that goes to make dentistry a learned profession. I cannot see how there can be an indifferent response to this call in a matter so vitally important to the betterment of the scientific standing of dentists as professional men; indeed, from every point of view."

2. Dr. Bissell Palmer, Jr., has expressed the following opinion:

"The strongest and most effective blow yet struck for the cause of independent journalism in dentistry was the recent publication of the masterpiece on the subject by Professor Gies. That article has been spread all over the country and is now arousing our profession to a shamed consciousness of the state of its journalism. We must deliver blow after blow of just this same educational character, until we have gained the support of the entire dental profession for the cause we work for."⁴

² I am indebted to the kindness of several dental friends for some of these references.

³ Register: *Journal of the Allied Dental Societies*, 1917, xli, p. 154.

⁴ Palmer: *Ibid.*, 1917, xlii, p. 210

3. The editor of one of the leading dental journals has commented on "the independent dental journal," as follows: ⁵

"The article written by Professor Gies on 'independent journalism versus trade journalism in dentistry,' and published in the December, 1916, issue of THE JOURNAL OF THE ALLIED DENTAL SOCIETIES, deserves to be widely read by dentists. Its appearance is most timely, and indicates that a new order of things is dawning in dentistry. Ten years ago there would have been no inspiration for the writing of such an article, and *surely no medium in which it could have been published*. Its appearance denotes the birth of new thought in dentistry, and indicates that in time dentistry, like the other learned professions, will have mediums that are not controlled by firms whose business it is to make profit out of the commercial side of dentistry.

"Undoubtedly, Patrick Henry's fiery speech on independence had much to do with the American colonies breaking away from England and establishing their independence. Let us hope that Professor Gies will be the Patrick Henry to American dentistry in its struggle to break away from trade journalism. When one analyzes this situation and compares it with existing conditions in other professions, one is appalled and then amused that a great science like dentistry should have remained quiescent so long with reference to this condition. How long would the science of architecture stand for its journals being dominated and controlled by a firm or group of firms that engage in the manufacture of carpenters' or plumbers' tools? How long would scientific chemistry stand for its journals being owned and controlled by the manufacturers of crude drugs, pharmaceuticals, or laboratory supplies? How long or how far would medicine progress if all the medical journals were owned and published by instrument and drug manufacturers? Your answers to these questions are an easy matter. In not one instance would either of the above sciences tolerate the dominance of their journals by trade influences. Then why should the dental profession stand for it?

"Its pernicious influence is obvious at a glance. Like an autocratic form of government, it may be beneficial, and then again it may be harmful. Why give trade power over science? Science always rules trade. Why try to do the absolutely impossible by making a great science subservient to the whims of trade and commerce? * * * It is impossible to publish a journal similar to dental journals published in this country today, and sell it for one dollar, *unless profit is made in other channels*. A journal published at this price will not return the publisher in gross subscription income five cents a copy, and that will hardly pay for the paper. But when a dental manufacturer can carry from thirty to forty pages of his own advertising at composition and paper cost, that otherwise would cost from \$1,500 to \$2,000 a month, besides making profit on his outside advertising, he is willing to lose on his subscription department. But who

⁵ Editorial: *International Journal of Orthodontia*, 1917, iii, p. 251.

pays for it in the end? It is not necessary to answer this question, its solution is too easy. The danger in trade-dominated dental journals is the opportunity given a manufacturer to play horse with the members of the dental profession when this manufacturer has something to sell. His advantage is evident at a glance."⁶

"It is a demonstrated fact that a 'little leaven leaveneth the whole.' The article of Professor Gies points the way to a new order of things. It may be long in coming, but its coming is assured."

4. Beginning in its March issue, the *American Dentist* has been reprinting my paper in monthly instalments.

5. On page 14 of the May issue of the *American Dentist*, Dr. R. J. Brown wrote:

"I want to thank Dr. W. J. Gies for his article on 'independent journalism versus trade journalism, etc.,' for I believe it will set a few of the men of the profession thinking."

6. On page 11 of the June issue of the *American Dentist*, Dr. J. A. Blue, writing under the caption, "trade-house organs do not represent true professional journalism," said:

"I have read the article on dental journalism in THE JOURNAL OF THE ALLIED DENTAL SOCIETIES, and found it very interesting. I agree most heartily with Dr. Gies that the dental profession has reached a state wherein we are no longer dependent upon commercial houses for our dental literature * * * I picked up a house-organ a few days ago, and the main article was a treatise on a sure cure for abscesses by the use of a preparation sold by the owners of the publication. * * * I love the supplymen; some of my best friends are among them; but they are selling dental

⁶ The above comment, by a well-informed dental editor, gives precise data on the points I raised in the following questions openly addressed, in my first paper (p. 595), to the owners of *Dental Cosmos*, but which its owners have declined to notice:

"The November (1916) number of *Dental Cosmos* (the last issue, at the date of writing) presents 77 pages of advertising matter. Of this total 32% pages are devoted to the goods of the S. S. White Dental Manufacturing Company. Is there any special financial advantage to your house, from this exceptionally extensive allotment of advertising space in your own journal? Is that 'financial advantage' related in any way to the subscription price of *Dental Cosmos*? Is that 'financial advantage' related in any way to your desire to continue to own and publish *Dental Cosmos*?"

In an advertisement in *Dental Items of Interest* (April, 1917), the J. M. Ney Company, referring amiably to my paper on dental journalism, made the following further journalistic statement of special interest to dentists:

"Suppose there were no so-called 'trade journals,' and that the strictly 'profess' carried only a few advertisements: How would it be possible for the J. M. Ney Company to inform dentists at home and abroad (about Ney's dental goods) . . . *Tico* channels—excluding traveling representatives—would be available. Either we (Ney Co.) should have to send out about 65,000 letters monthly to dentists, dealers, and laboratories, or else publish a 'house organ,' or both. We prefer to use reputable dental publications instead and shall do so, as long as they exclude advertisements of questionable or dishonest goods and remain non-partisan—whether they are 'professional' or 'trade.'"

The mercantile advantage of a "house organ" is thus publicly indicated by a house that is widely known to dentists.

supplies, and we are rendering professional services. We are to teach the public how to care for their teeth, and this duty, by all means, should not be performed by tooth-paste venders."

It is a great satisfaction to see that Dr. Blue's professional sense has not been anesthetized by the partisanship of personal friendships, and that he does not imagine that fealty to the ideals of his profession must be sacrificed to fidelity to personal friendships, when the two conflict. See page 314 for a different idea on this point.

[In my first paper on this subject I referred to a circular trade-letter, about S. S. White Tooth Paste, "because of its direct relation to our appreciation of the dangers inherent in trade journalism in dentistry." Dr. Blue, alluding to this matter in the discussion from which the foregoing is quoted, had this to say (p. 11):

"The tooth-paste proposition of The S. S. White Company is positively ridiculous. The sight of a great and wealthy corporation trying to hide behind the profession to put over such an advertising scheme would be amusing to the party standing by the way-side watching the procession, and observing the dental profession marching ahead with The S. S. W. in the band-wagon throwing tooth-paste and booklets to the surging throng. Dentists are too quick to give their endorsement to tooth-pastes and mouth-washes of *unknown merit and even of unknown formulæ*." See page 360 of this issue of the JOURNAL.]

7. In a letter to the editor of *Oral Health*, Dr. Harold Clark wrote:

"The article (by Gies) starts off in an atmosphere of the loftiest ideals * * * and conjures up a dental journal very suggestive of a journalistic millennium * * * Now, for over twenty-five years I have been a constant reader of the *Dental Cosmos*, and it has always seemed most obvious to me that a very definite understanding must exist between the editor and the owners, that the journal was *his* and the advertising pages *theirs*, and that the business office of the company must not cross the threshold of the editorial rooms * * * I am quite unable to understand the animus that could prompt his (Gies') article and (him to) select the *Dental Cosmos* for the vials of his wrath."¹

I commend to Dr. Clark's attention, and I suggest for his comment in reply, the following statements from an editorial in the May, 1917, issue of the *International Journal of Orthodontia* (p. 301) which accord so closely with an outline of what an

¹ Clark: *Oral Health*, 1917, vii, p. 124.

editor of a supply-house journal told me in his own personal editorial defense, in February, 1916, that I fancy he is the man to whom the editorial refers:

"We remember recently an editor of a large dental journal making a statement that he never read the advertising that appeared in his own journal because he did not care what was in there as he was concerned only with the editorial policy. While that may be one way of ridding oneself of the responsibility, nevertheless, it appears quite embarrassing for a man to advocate one thing editorially, for one thing to be advocated in articles in his journal, and just exactly the opposite to be advocated in the advertising pages of his journal. We do not believe an editorial writer or editor of a dental journal should excuse himself by saying he does not read his advertisements and is therefore in no way responsible.

"The same editor also made the statement that it was a very difficult thing for dental journals to control their advertising matter, for if a journal refused to publish the advertisements of one concern, the concern could get out an injunction claiming the journal was not fit to circulate through the mails, and thereby cause a great deal of trouble to the journal before the same would be allowed to be circulated through the United States mails. This argument is about the same as if someone were to say that we should not criticise anything regardless of what it is because someone would be liable to bring a damage suit against us and we would be compelled to defend ourselves in a damage suit. We realize through the laxity of the United States Court that it is possible for anyone to file suit against anyone else, for anything whatsoever, thereby causing the party to be inconvenienced in defending the suit. Nevertheless, we believe that the advertising pages of a respectable dental journal should be controlled by the editorial department. While it is almost an impossibility for an editor of a dental or medical journal to read all the advertising matter which is to appear in his journal before it is published, nevertheless, it is not impossible for the publisher of the journal to have a contract so arranged with their advertising customers that an objectionable copy of an advertisement can be eliminated if the advertising copy is objectionable to the subscribers or the editorial department. Such a contract would eliminate the possibility of a damage suit by copy being refused and allow the editorial department the possibility of reviewing and changing such advertising as is objectionable to their readers.

"We realize that a certain number of dental journals are run solely for the advertising department and advertisers, and the scientific section becomes secondary. This is proved by the fact that a large number of dental articles and scientific articles are nothing more than commercialized articles for we remember a short time back a famous so-called scientific article appearing in the first pages of the reading matter of a dental journal while in large type appearing on the first page of the advertising sec-

tion was a large poster advertisement calling attention to the article which appeared in the scientific section. In other words, the article in the scientific section was describing a commodity which was sold by the house that published the dental journal and which article was the same as was featured in the advertising section. Therefore we can only expect such dental journals to make their scientific and editorial sections secondary to the advertising sections, which impresses upon us the prime need for dental journals to serve the scientific wishes of their editors and readers and not to serve the advertising managers of supply houses. We also realize it is a very difficult proposition to satisfy all of our readers as regards scientific articles and advertising."

In view of Dr. Clark's opinion that the separation of advertising from other interests in the conduct of a so-called professional journal is a satisfactory professional arrangement, I am sure Dr. Clark would be edified if he were to read an editorial in the *Journal of the American Medical Association*, of the issue of February 24, 1917 (p. 637), entitled "the freedom of the medical press," in which occur the following observations, the first paragraph of which refers to published claims of "independence" and "unafraidness" by an official representative of editors of journals in medicine of the professional caliber of the supply-house journal in dentistry:

"The 'unafraidness' of most of the editors of so-called independent medical journals is really a contempt for the wishes and opinions of the medical profession and a deadly dread of incurring the displeasure of the advertiser. How many so-called independent medical journals will discuss, without fear or favor, problems that may involve products which they advertise? They may be counted on the fingers of one hand! Not long ago the 'unafraid' editor of one 'independent' medical journal published a tabulated list of nostrums which the government had declared false and fraudulent, overlooking the fact that in the same issue of his journal he was carrying a half-page advertisement of one of the nostrums listed. He demonstrated his 'unafraidness' by publishing in the next issue of his journal an apology—not to the medical profession, *but to the advertiser of the nostrum in question!* 'Whose bread I eat, his song I sing' !

" . . . Slowly but surely the medical profession is awakening to the fact that it has been, and still is, shamefully exploited by the proprietary medicine interests. Physicians are beginning to realize that the *last stronghold* of the nostrum interests is the *advertising pages of the nostrum controlled medical journal*. Even this defense is crumbling. Medical men are learning that they cannot eat their cake and have it; *they cannot*

expect medical journals that are supported by the nostrum interests to reflect professional ideals. The advertising standards of the typical privately owned medical journal are lower than the advertising standards of the better class lay magazines and of the more progressive newspapers. A publication is no cleaner than its dirtiest page."

8. The editor of *Oral Health*, commenting on Dr. Clark's letter to him (quotation above), said (p. 125) :

"The author (Gies) objects to dental magazines being published by dental manufacturers. Such a subject may be decently discussed without singling out from the whole group just one manufacturer, one magazine and one editor, and referring to them in such an objectionable and personal way as to defeat the whole purpose of the article. The reader, though naturally sympathetic, is left with nothing but a brown taste. The wonder is that much of the manuscript ever escaped the official blue pencil."⁸

The S. S. White Dental Manufacturing Company has a full page advertisement in the issue of *Oral Health* in which the editorial comment just quoted is published.

9. I have been specially interested in the detailed dissection to which Dr. T. P. Hyatt subjected my paper,⁹ particularly because he wrote in behalf of the editors of *Dental Cosmos* and *Dental Items of Interest*, who, he says he *knows*, "do not consider themselves editors of trade journals as defined by Professor Gies" and who could not reply to that paper "without first tacitly admitting that Professor Gies was justified in the definition he wished to impose upon them."

Dr. Hyatt wrote, in parts of his paper, with the directness and candor that delight all who believe not only in free speech, but in "straight talk." Interspersed throughout Dr. Hyatt's paper are the following *personal* allusions to me :

He (Gies) has "insulted the dental profession of America" (p. 171); he "descends to sarcasm, slang, and insinuations against the character and integrity of some of the best men in our profession" (p. 172); he "casts slurs" (p. 174); is "rude" in his questioning, and has offered "an insult to each individual member of the First District Dental Society who elected Profes-

⁸ The reader will be struck by the fact that there is no argument in favor of supply-house journalism in the remarks, in sections 7 and 8 above, by Dr. Clark and the editor of *Oral Health*.

⁹ Hyatt: *Journal of the Allied Dental Societies*, 1917, xii, p. 171.

sor Gies an honorary member of their Society" (p. 175); his "remarks are unfortunate, unjust and uncalled for," and he makes a "charge that is absolutely false" (p. 180); some of his remarks are "not tactful or polite" and he is grossly ignorant about the meaning of a certain medical emblem (p. 182); and he "violated all the rules of justice and fair play" (p. 184).

I am satisfied that Dr. Hyatt overlooked nothing, in this relation, in his effort adequately to characterize my paper and his impressions of it, and, of course, I accept, with all due appreciation, these earnest unfavorable opinions that my paper has induced Dr. Hyatt to entertain and express. I cordially invited reply to, and criticism of, my paper, and Dr. Hyatt has seemingly done his best to respond emphatically.

10. Dissenting editorial comment on some of the statements in Dr. Hyatt's paper—comment endorsing my own position—was published in the issue of this JOURNAL containing his paper.¹⁰ (See page 315.)

The foregoing *published* allusions, which appear to "represent all shades of opinion," reveal the diversity of convictions that frank public advocacy of progressive change usually elicits. The earnestness of the foregoing quoted comment is very gratifying, for it implies that the primary purpose of my paper—to stimulate effective general discussion of the deplorable journalistic situation in dentistry—promises to be attained.

III

Practically all of the published adverse allusions to my paper, that have come to my knowledge, are included in the scope of Dr. Hyatt's criticisms. I shall, accordingly, direct my responsive remarks to some of the comment by Dr. Hyatt.

1. Dr. Hyatt expressed the opinion that I did not indicate definitely what I meant by the designation, "trade journal" (p. 173). I thought it was made very evident that the expression, "trade journalism," was used in one of its commonly accepted meanings, viz., to signify specifically, in this instance, what is often called "supply-house journalism." The whole tenor of my

¹⁰ Editorial: *Journal of the Allied Dental Societies*, 1917, xii, p. 270.

paper shows that I used "trade journalism" in this particular sense. All the commentators referred to above, unlike Dr. Hyatt, seem to have understood that such was the case. In harmony with his seeming failure to apprehend the obvious in my paper, in this relation, Dr. Hyatt consistently refrained, in the preliminary part of his reply, from addressing himself to the essential point at issue. He wandered so far afield, in fact, as to allow himself to assert, apparently with full personal authorization, that he *knows* (p. 182) "that the editors of *Dental Items of Interest* and *Dental Cosmos* do not consider themselves editors of trade journals as defined by Professor Gies" and that, on this account, "they could not accept such an invitation (to respond to the criticism of supply-house journalism) without first tacitly admitting that Professor Gies was justified in the definition he wished to impose upon them." If *Dental Items of Interest* and *Dental Cosmos* are not conspicuous representatives of supply-house journalism, what are they? Are not their editors willing to admit this fact, which is proclaimed on the face of each issue of these journals? Does Dr. Hyatt mean to say that he "*knows*" these editors do not admit this well-known fact?

In order that Dr. Hyatt may have no further occasion to misinterpret my attitude, and also that all for whom he appears to speak publicly in this relation may be assured, if they are interested, that I have been attacking supply-house journalism and nothing less, I now call special attention to the following unequivocal remarks on this subject, on p. 582 of my paper in the last December issue of this JOURNAL:

"In view of the prevalence of such convictions as these *among professional men generally*, regarding the dishonor involved in the subservience of a profession to trade journalism, it is astonishing to find that dentists, as a body, appear to see nothing professionally reprehensible or discreditable in the present dominance of dental journalism in this country by periodicals issued from, or by, supply-houses. I have spoken frankly, on several public occasions, in criticism of this professionally degrading situation in dentistry. . . . With cordial good-will for dentistry as a profession, and for the hundreds of dentists I have the honor and pleasure to know individually, I now address to the dental profession the following remarks on this unpleasant and dangerous subject, *against a system, not against individuals.*"

Can there be any reasonable doubt that this quoted statement

of mine refers directly, explicitly, and comprehensively, to supply-house journalism in dentistry?

In the comment quoted above from Dr. Blue's remarks, there was due appreciation of the fact that by "trade journal" and "supply-house journal" and "supply-house advertising periodical," I referred to what Dr. Blue designates, with equal definiteness, "trade-house organ."

2. Dr. Hyatt is very unfortunate in the many striking contradictions he expresses in his paper. Thus, at the beginning of his paper he suggests, as I indicate above, that he did not comprehend that I had attacked, directly and specifically, supply-house journalism. At the end of his paper, however, he shows that he agrees with me in opposition to that particular kind of journalism. Dr. Hyatt wrote quite irrelevantly in personal defense of Drs. Ottolengui and Kirk, but very evidently in admission of the professional undesirability of dominant supply-house journalism. I did not personally attack his friends but I did very directly assail supply-house journalism as the accepted form of professional dental journalism. Therefore, there is no real difference between us "on the question before the house."

The perfect accord between Dr. Hyatt's sentiments and my own opinions, on the main point in the discussion, is shown by the expressed conviction with which he closed his reply, and which I assume is his *matured* opinion, as follows (pp. 184-85):

"With the *alteration of one word*, I (Hyatt) wish to conclude these comments by quoting in full one paragraph from the editorial in the December number of this magazine" and which not only expresses my sentiments, but also *expresses the truth in regard to this whole subject*.

"Just here, however, it is only fair to confess that "*all*" of the fault lies on our side. How many dentists, taken by and large, give any serious thought to this matter? How many care what the activities of the commercial concerns may be? How many dentists at this date would make any serious sacrifice to establish and safeguard an untrammelled professional journalism? Our reforms must begin at home. We cannot expect the trade houses to abandon this highly profitable "mingling of interests" while we remain not only indifferent, but willing by voice and act to coöperate with them. If, as practitioners of a specialty in medicine, we hope to fill responsibly our place in a great and learned profession, we must adjust our lives

¹¹ This editorial *endorsed* the objection to supply-house journalism.

to the spirit of that high calling, and by unmistakable action, *banish even the suspicion of divided motives.*"

The editor of this JOURNAL, observing the contradictions in Dr. Hyatt's reply to my paper, commented editorially on Dr. Hyatt's position, in the same issue, as follows (p. 270):

"Dr. Hyatt complains of an obscurity of meaning in many of Dr. Gies' questions, but it may fairly be asked just where Dr. Hyatt stands in the whole question of dental journalism. He expresses enthusiastic approval of 'our owning, supporting and publishing our own journals'—and is willing to contribute \$100 a year for ten years towards the consummation of that object. Then he states, in effect, that so long as a supply-house journal refrains from 'writing up' commercial products in its *literary section*,¹² "such a journal is, I (Hyatt) maintain, a professional journal in the *broadest and most liberal sense*, absolutely regardless as to who pays the printers' bills and whether there is a loss or profit in the financial management."¹³ Since the prominent and well edited supply-house journals are eminently worth while, financially, for their proprietors (we all credit them with the good business sense to be sure of that fact) and further, since such a journal can afford to publish at a minimum cost to the dental profession—then why, it seems proper to ask, should anyone waste good enthusiasm, self-sacrificing effort, and \$100 a year on a journal maintained on its own bottom?

"Dr. Gies asks the question whether or no, in regard to ideals concerning the production of our literature, dentists are lacking in self-respect. We have stated in the original version of the above paragraph (the one given above as having been quoted by Dr. Hyatt, pp. 584-5, from editorial comment in the December issue of this JOURNAL: W. J. G.), that '*much*' of the fault, in our unenviable position to-day, lies with us. Dr. Hyatt echoes that sentiment, changing the word '*much*' to read '*all*.' If honest, adverse criticism constitutes a '*slur*' in this case, then to Dr. Hyatt we must accord the palm for having '*slurred*' his profession most unqualifiedly, comprehensively and effectively. *But we do not admit the premises.* Dr. Hyatt and hundreds of other intelligent men know we need this bitter medicine—that a wholesome corrective is needed to sweep away the inertia and the complacency which in these days retard our growth in matters above and beyond the problems of the day's work."

3. Dr. Hyatt essays to answer some of the "questions propounded" in my first paper on this subject. In the section of his paper devoted to this particular purpose most of the directness, candor, and effectiveness, I expected to witness are conspic-

¹² No reference to the *advertising* section! "Anything goes" in that section, apparently. See page 309.

¹³ This very low standard has been rejected by the medical and other professions. See pages 306 and 310.

uous by their absence. Instead, there is evidence of an excess of the emotionalism of personal resentment. Dr. Hyatt makes the surprising blunder of regarding all the questions in each group, *on a particular theme*, as a single question in each case. He says, "each question contains so many parts that they are almost confusing." Attentive readers will not be confused by the questions. It is evident, however, that "confusion" was dominant in the evolution of Dr. Hyatt's responses to the questions. This will be very obvious to any interested reader who may care to go further into this phase of the discussion by looking into this matter critically for himself.

After alluding to the first eight groups in the first series of questions, Dr. Hyatt wrote (p. 181):

"It seems to me unnecessary to answer all of Professor Gies' questions, as it would not only take up a large amount of space, but also because those who have read Professor Gies' article, and are now reading mine, will know how I (Hyatt) should answer them."

I regret to disagree with Dr. Hyatt in his opinion that his answers to additional questions in my paper could be predicted from what he has written. I say this because many of his remarks are contradictory, most of his answers to questions are palpably non-responsive, and his attention was plainly diverted by personalities.

Dr. Hyatt alluded serially to the first eight groups of questions in the first series of fifteen such groups. Since Dr. Hyatt restricted his allusions to eight groups of questions, I regret that he picked out the first eight *in sequence* rather than the most comprehensive eight in the entire list of questions. I note that Dr. Hyatt, discontinuing his discussion of the questions with his allusion to the eighth group, paid no attention to the ninth group. In view of one of Dr. Hyatt's expressed opinions regarding acceptable standards of professionalism in dental journalism, as quoted above from his paper (p. 315), and of his expressed purpose to speak in behalf of two editors named by him, I am surprised that he did not take occasion to respond, in addition, to the ninth group of questions, which ran as follows:

"9. Why is it that dental editors of trade-journals insist privately to their self-respecting colleagues, often publicly, that they (the accredited

representatives of dentistry) do not accept personal or professional responsibility for the policies and practices of the advertising departments of their journals? Is it because these dental editors mistrust, and are not permitted to control, the advertising policies and practices which they are obliged to ignore in order to draw the editorial salaries they receive?"

I regret that Dr. Hyatt did not respond, with personal knowledge and understanding, directly to this group of questions.

I wonder, also, why such questions as the following were ignored, in preference for less comprehensive ones—questions which bear on the dangers to dentistry that are inherent in the effort of dentists, however honest, to serve editorially the interests of supply-houses and of the profession of dentistry, at one and the same time:

"10. Could the owners of a supply-house reasonably ask more from any dentist than that, in editing their journal and helping to give it high editorial worth and great *circulation value*, he would leave all the advertising business 'to the house'—and mind his own business besides?

"11. To what extent may a dentist serve a powerful interest not in accord with the aims of his profession, *e.g.*, a supply-house journal, without losing his professional standing among dentists? Are not some men, of presumably most general professional acceptance in dentistry, showing periodically, through their actual or pretended editorship of trade-journals, that the dental profession appears to accept anything that may be imposed on it in this connection?

"12. What would be your opinion of the President of the United States, if, while President, he were to accept appointment to the position of attorney-in-chief for the 'Association of American Railways?' *The railways are essential public utilities. We want their owners to derive substantial profits from their operation; we expect these public utilities to afford excellent general railway service at fair rates.* But why do we require public officials, from the President down, to refrain from accepting 'retainers' from the railways? Is it because we know that the special financial interests of the railways and the general public welfare may, and often do, conflict, and that an *honest* man could not simultaneously serve both the railways and the public, *manfully*, under such conditions, *however honorably he might serve either?* Is it because we know that the function of public service cannot be subordinated to financial exploitation of that function, without detriment to the public? Can the profession of dentistry be subordinated, by dental editors, to the tradesman's journalistic exploitation of dentistry, without serious detriment to dentistry?

"13. Do you expect the owner of a trade-journal to conduct his journal primarily 'for the benefit of the profession' or primarily 'for

the benefit of his business?' What do you presume the owner of the trade-journal *expects and requires?*

"14. Free speech is as essential to progress in dentistry as it is to liberty in a democracy. Can the editor of a trade-journal in dentistry reasonably expect any one to believe that *he* believes he is always *free* to speak professionally on trade relationships and commercial interests in dentistry—*while he holds his editorial job?* Is it reasonable to believe that the editors of trade-journals are entirely free to ignore the specific demands and particular interests of individual trade ownership? Can the editor of a trade-journal expect to be above the very strong and justifiable suspicion that he 'hears his master's voice' and harkens to its behests?"

4. One of the surprises in Dr. Hyatt's paper is the evidence it presents of a large number of palpable misreadings of very plain and direct statements in my own paper. The critical reader will note a profusion of these misapprehensions in Dr. Hyatt's rejoinders. Thus, Dr. Hyatt fails to comprehend the obvious import of my allusion to action taken recently by the Society for Experimental Biology and Medicine, which action bears, as I said, on "*current medical and scientific thought on the relation between trade and the professions.*" Dr. Hyatt says that "to me (him) it is rather amusing that an organization should adopt such an amendment (as the following) worded as this is worded:

"Any member of this Society who may *consent* to the use of his name in any way that would aid in increasing the sale of any patent medicine, proprietary food preparation, or any similar product for which, in the opinion of the Council, inaccurate or misleading claims are made, shall forfeit his membership."

Dr. Hyatt was so much "amused" when he read this amendment that he did not observe that its language logically provides for forfeiture of membership by any member who, "in the opinion of the Council," permits his name to be used in *any* way, for the purpose or with the result indicated, in relation to *any* article for which *anybody* (including owner, manufacturer or agent) makes *any* claim that is not *wholly* founded on definitely *established scientific fact* or which is either, by accident or design, misleading in any degree—such forfeiture of membership to occur unless, of course, the one whose name was misused, *publicly* states and repudiates the misuse of it, thus removing the element of consent. The Society believes that the production and sale of *useful* and reliable "patent medicines, proprietary food preparations or simi-

lar products," are worthy of any man or group of men, but the Society insists that if its members facilitate trade of this kind, which is potentially very dangerous to the public, such trade must be conducted honorably, on a basis of truth and justice, and *primarily* in the public interest on a par with strictly professional service. The Society puts upon its members the burden of showing that any trade relationships on their part are of this unusual, desirable, and public-spirited quality.

In the paper to which Dr. Hyatt replied, I referred to the fact that a member of the Society had been expelled recently because of violation of this constitutional provision; his offense had been *failure to withdraw his continuing support* from a medicinal article for the encouragement of whose sale *others than himself, to his knowledge, ultimately made inaccurate and misleading claims*. His fault was *nominal tolerance of commercial misrepresentation* by others, not personal dishonesty.

This "amendment" plainly and purposely *prohibits practically all mercantile relationships* for members of this Society, because the Society recognizes the fact that *unintentional* inaccuracies and exaggerations of enthusiastic promotion of the sale of goods are very apt to characterize *honest* trade exploitation of *even the worthiest products*. The Society is so earnestly unselfish in its aims that it prefers that its members do not run even this relatively slight risk of degrading the professional status of itself and themselves.

Any member of this Society who would continue to permit the use of his name to help to sell a dentifrice for which *any* unwarranted claim of *any* kind had been made by any promoter, to his knowledge, in furthering the sale of even a single sample of the product, would be liable to forfeiture of his membership. No member of this Society could become an editor of any of the present supply-house journals in dentistry without forfeiting his membership, because his name, and the professional significance of that name, would, in spite of himself, become an advertising fixture for the owning supply-house; and he would, willy nilly, become a potent factor in persuasive publicity in behalf of every article in every advertisement in every issue of his journal, whether such advertisements told nothing but the truth or nothing

but falsehood. Eminent editors of supply-house journals, who may justly pride themselves on their professional honor and their personal integrity, are apt to overlook this unprofessional degradation to which their standing is thus automatically subjected.

I hope these further exegetic statements on this subject will not increase Dr. Hyatt's "amusement" nor add to his perplexity regarding my evident purpose in mentioning this "amendment" in a discussion of the discredit, to dentistry, of dental subservience to supply-house journalism.

IV

Dr. Hyatt conceded the main point in my argument against supply-house journalism and presented nothing in support of such journalism either as a desirable policy for, or system in, dentistry. I believe that, with this important fact before us, I can most effectively promote further direct discussion of the general subject of supply-house journalism by declining to respond to the many irrelevant personal remarks with which Dr. Hyatt's paper is illuminated. Two purely personal matters seem to be of sufficient importance, however, to *require* the brief attention I give them below.

1. Dr. Hyatt insists that I have "insulted" the dental profession. This charge is one of the irrelevances that more judicial authorship would surely have refrained from suggesting. I do not believe the dental profession is as vain or as childish as Dr. Hyatt would have us believe. This wanton personal charge by Dr. Hyatt—that I have insulted individual dentists and the whole profession of dentistry—was so effectively and completely disposed of by the dental editorial comment in the number of this JOURNAL containing Dr. Hyatt's paper, which I quoted above (page 315), that I am satisfied I need not say a word in my own personal behalf on this score.

Dr. Hyatt's objections in this regard appear to relate to matters of form rather than of fact. But the *form* of my indictment of supply-house journalism is quite incidental to the *facts* in that indictment. Those who defend supply-house journalism are confronted by the

necessity of defending supply-house journalism *as a system*. Superheated defense of the personal integrity of individual supply-house employees, and vitriolic attacks on the form in which truth about supply-house journalism is suggested, are pointless. It is not an adequate defense of autocracy, for example, to allude to the high character of individual autocrats nor is autocracy justified by pointing to the benevolence of autocratic domination in some instances. We of America are opposed, on principle, to autocracy, in any and every form—we fear and fight autocracy *as a system*, no matter who or how worthy its individual exponents may be. In the same spirit, the man who is primarily a professional man will distrust and detest supply-house journalism *as a system*, no matter who or how worthy its representatives may be.

It is very noticeable that apologists for supply-house journalism in dentistry do not declare frankly that they consider dominant supply-house journalism a credit to a profession and an honor to dentistry in particular. They should show us that supremacy of supply-house journalism in dentistry is more desirable and more in accord with professional self-respect, in dentistry, than it was in medicine, for example, and why. They should demonstrate that supply-house journalism has not long since outlived its original usefulness but that, *as a system*, it deserves well of the profession, because it is now conducted in truly professional zeal, and is devoted exclusively to strictly professional aims and ends. But nobody makes this demonstration. Dr. Hyatt's paper not only fails to show any of this, but he admits that "all of the *fault* (for the continued, accepted, and undesirable, dominance of dental journalism by supply-houses) lies on *our* (dental) side"—the "side," that, he says, I have "insulted" by calling to its attention, plainly, a few disagreeable truths. (See page 314.)

If the defenders of supply-house journalism in dentistry refrain from saying anything in advocacy of such journalism as a dominant *system*, but, instead, do nothing better in its avowed support than ventilate personalities in behalf of its beneficiaries and in opposition to those who dare to attack it, then surely the cause of supply-house journalism in dentistry must be as mori-

bund as was that of the House of Romanoff when the people of Russia awoke to the fact that the "blessings" arising from the rule of the Romanoffs were damnations in disguise.

2. The second of the two purely personal allusions to me in Dr. Hyatt's paper, that the reader who follows this debate may expect me to notice, was Dr. Hyatt's reference to "one of the most remarkable parts of Professor Gies's article"—the part pertaining to "an emblem that is used upon many medical books, upon the uniforms of medical officers of the United States Army and Navy, and, I (Hyatt) believe, on the medical uniforms of almost every army and navy of the world. It is plainly evident to anyone," Dr. Hyatt adds with icy gravity, "that Professor Gies has no conception, comprehension, understanding or knowledge of the meaning and significance of this emblem. He (Gies) speaks of it in a paragraph devoted to sarcasm * * * to criticism of this emblem."

My reply to this absurd charge of gross ignorance on a very elementary medical matter is, simply, that I have long known something about the sign of Æsculapius and that I have long been able to recognize it on sight. Having been a fairly industrious student of the medical sciences and medical history continuously since 1893, and a moderately active officer in the School of Medicine of Columbia University since 1898, it may not be immodest to suggest that I could hardly have failed to acquire this fragment of knowledge, even by accident, in spite of a lack of ordinary professional intelligence that may be one of my numerous deficiencies.

I am disappointed to find that a man of Dr. Hyatt's intelligence can be so completely lacking in the sense of humor as to misconstrue so ridiculously what I wrote in this connection. Instead of "criticising the emblem," or exhibiting any ignorance regarding it, I stated very plainly that I "recorded these ideas as a constant reader's rather vivid IMPRESSIONS when he looks at the face of *Dental Cosmos* and accepts the suggestions there offered." Expression of the conventional significance of the emblem was avowedly ignored by me in behalf of the unconventional impressions the emblem and its accessories, so situated, presented to mind.

V

Certain criticisms of my paper that appear in Dr. Hyatt's response to it, and which have been brought to my attention from other sources, were discussed briefly in correspondence with dental colleagues last winter. I append a copy of censored portions of a letter, written by me with quotations from earlier letters of mine, to indicate impersonally some of the views I have already expressed privately in this relation—views that I hold with even greater earnestness, if that is possible, since I read Dr. Hyatt's paper.

"I should be indebted to you, also, if you would read to your associates the following from letters written by me, on February 15th and February 23rd, to a friend of Dr. — and mine, which clearly sets forth my general attitude on this whole subject.

"Quotation from my letter dated February 15th:

"I have read with great interest, the copy of Dr. — letter to you, dated February 10th, that you forwarded to me with your note of February 12th.

"Let me say very briefly and to the point, in comment that you may feel entirely free to show to Dr. —, that I think his objection to my paper is based on inverted reasoning as well as on personal grounds that have nothing to do with the case. The gist of his argument is that no system, however vicious it may be, can be properly attacked unless something is done wholly to vindicate *all* possibly and presumably innocent agents and beneficiaries of that system. I ought not, if Dr. — view is correct, to advocate prohibition of the liquor traffic, for example, without previously mollifying the feelings of *all* the poor widows and orphans—to be mentioned by name as 'honest' and 'honorable'—who *live* on the 'saloon business that father left as his estate when he died.'

"Your note was written on the anniversary of Lincoln's birth. We hear much nowadays about what Lincoln would 'do' and what Lincoln would 'say.' We justly regard him as one of the very great men of history. When Lincoln indicted slavery, he 'shot' at the *system* of slavery, not at the individual slave-owners who happened to be kind and humane to their slaves. Some of these slave-owners were among his friends. He was never required or expected to publish a list of the personally commendable slave-owners in order to exonerate these well-meaning beneficiaries of an inhuman *system*. Lincoln shot at a *system*, he brought about the downfall of that *system*; and he was never held, for manslaughter, for the deaths of those who were innocently killed as a direct or indirect result of his firing at slavery and thereby, incidentally,

at the individuals who maintained and supported slavery, and derived gain and profit from its continuance.

"If the journalistic *system* I have attacked—and to which attack Dr. — objects—is benevolent and beneficent, rather than a danger and a detriment, I hope Dr. — will show that I am wrong in assailing it; and the more effectively he exposed, *publicly*, any fallacies and injustices in my argument, the more I should respect and esteem him. * * *

Quotation from my letter dated February 23rd:

"I have read with interest Dr. — letter to you dated February 17th, in which Dr. — suggests that I state publicly that, in publishing my paper on trade journalism in dentistry, I 'did not mean any personal attack on me (him) and that so far as he (I) knows, the — may be conducted on entirely professional lines.'

"My paper states, and shows very plainly, that I have attacked a *system not individuals*. If any individuals have been hit, it was solely because, and wholly incidental to the fact that, they were parts of the *system* at which I am aiming and *at which I expect to keep on shooting*. I have no *public* reason, therefore, to single out Dr. — and, by a superfluous disavowal regarding him, lay myself open to the unjust charge that I *have* personally attacked *all the other* unnamed editors of trade journals in dentistry.

"I have no public reason for excepting — from my indictment of dental trade journalism at large. I do not personally know that it is 'conducted on entirely professional lines.' If — is a strictly professional journal, the dental public must know it and, therefore, does not include that journal in my indictment. If the dental public does *not* know that — is 'conducted on entirely professional lines,' an assurance to that effect by — itself would seem to be the most effective way publicly to establish the fact.

"The only thing that I can do, under present circumstances, is *publicly* to hold my position until attention is drawn *publicly* to an error or injustice in what I have written. I should then *publicly* make all due acknowledgment and correction.

"I have endeavored to do the profession of dentistry a service. *I cannot permit personalities to modify either that intention or my conduct as I have projected it on the basis of that purpose.*

"I should be glad if you would make it plain to Dr. — that it is useless for you and me to discuss the matter, unless the discussion relates to facts demonstrating directly that I have made misstatements about, or misrepresentations of, trade journalism in dentistry.

"I have made it plain that I do not believe a journal representing a profession, but conducted for the financial benefit of a supply-house, is a project that is worthy of professional approval or of professional support. I believe *all* such journals weaken professional self-reliance and impair

professional self-respect. I have publicly invited the trade journals in dentistry to show that this belief, which is by no means peculiar to me, is unwarranted. I should think Dr. — would welcome the opportunity thus afforded to show to the dental public conclusively that — is an exceptional dental journal.

"My paper on dental journalism voices convictions that are held earnestly and with full appreciation of their unpopularity among dentists. But they are convictions that will remain until they are disposed of by demonstrated facts to the contrary; and until then I shall continue to express and to defend them, privately and publicly."

The editor referred to, in the correspondence from which the foregoing is quoted, has not taken the trouble to show *publicly* that my paper on supply-house journalism is untrue in any respect, or unjust in any particular to the *system* of dental journalism of which he is a prominent exponent, although, *privately*, he has manifested particular concern that I should *publicly* state that his journal is not the kind against which my paper was directed. Just why he does not do this for himself I have not learned. If my paper was not too insignificant for his *private* attention, why should he hesitate to give it *public* notice?

VI

I have read with great satisfaction the following statements in the February, 1917, issue of the *American Dentist*:

"The subscription list and good will of *Gold Nuggets*, published by the Keeton Gold Company, of Kansas City, has been sold to the Dentist Publishing Company, and commencing with the February issue all subscriptions in force for *Gold Nuggets* will be completed with the *American Dentist* (p. 8)."

"The taking over of *Gold Nuggets* is a sign of the times in dental journalism. The profession is realizing that professional progress and dignity demand periodical literature of high class, entirely independent of the commercial and manufacturing interests connected with dentistry (p. 12)."

Amalgamation, such as this, offers a very gratifying solution of certain financial problems connected with dignified discontinuance of supply-house journalism.

VII

A summary of the gist of the *published* allusions (now

known to me), to my paper in criticism of dental subservience to supply-house journalism, is appended:

A. Those who have endorsed the objection to dental subservience to supply-house journalism:

1. *American Dentist*, Chicago, Ill.
2. Brown, Dr. R. J., Norfolk, Va.
3. Blue, Dr. J. A., Birmingham, Ala.
4. *International Journal of Orthodontia*, St. Louis, Mo.
5. *Journal of the Allied Dental Societies*, New York City.
6. Palmer, Dr. Bissell, Jr., New York City.
7. Register, Dr. H. C., Haverford, Pa.

B. Those who have adversely criticised the paper, without advocating the continuance and development of supply-house journalism as a desirable system of professional journalism in dentistry:

1. Clark, Dr. Harold, Toronto, Can.
2. *Oral Health*, Toronto, Can.
3. Hyatt, Dr. T. P., New York City.

C. Those who have adversely criticised the paper, and also have advocated the continuance and development of supply-house journalism as a desirable system of professional journalism in dentistry:

Nobody.

VIII

I earnestly hope that each of those who are opposed to the continued subservience of dentistry to supply-house journalism will actively do two important things as soon as possible, viz.:

(1) Give his professional and financial support to at least one journal conducted professionally by and for dentists;

(2) Publish an indication, however brief it may be, of his attitude on this question, in order to further a pacific revolution in behalf of journalistic democracy in dentistry.

ORAL DISEASES OF ANCIENT NATIONS AND TRIBES¹

BY KURT H. THOMA, D.M.D., BOSTON, MASS.

HISTORICAL works give us very little information about diseases of the teeth or the practice of dentistry. No doubt old and valuable records of dental diseases and descriptions of remedies and modes of practice for treatment of the teeth and jaws were lost by the destruction of the Alexandrian library.

The oldest people of whom we have records are the Egyptians. The Greek historian, Herodotus, who was born 484 B. C., went to the shores of the Nile to learn the sacred mysteries and sciences of this nation of advanced learning and high civilization. He found that surgery and medicine were divided into distinct professions. There were surgico-physicians who treated the diseases of the eye, the ear, the teeth and the digestive tract and there was an appropriate professor found for each of the different classes of local and general diseases.

These physicians were required to study the precepts laid down for them from the experience of their predecessors before they were allowed to practise, and when they were ready to begin work they were paid salaries by the government, although it was not illegal for them to receive fees from the wealthier patients in return for their advice and attendance. They also examined the bodies of the dead to ascertain the nature of the different diseases.

This highly specialized practice of medicine resembles very much our modern system and it probably would have developed into great efficiency and knowledge of the various branches had not each doctor been restricted under a penalty of death to certain fixed prescriptions. It was in order to prevent dangerous experiments being made on patients that a law was enacted whereby they adjudged it a capital offense if the death of a patient resulted

¹ Read before Boston and Tufts Dental Alumni Association, Boston, Mass., 1917.

from treatment contrary to the established system. If, however, every remedy had been administered according to the sanitary law, they were absolved from blame and if the patient was not better, the physician was allowed to alter the treatment after the third day, or even before, if he took upon himself the responsibility.

In general these people believed that most of their troubles came from indigestion and they prescribed abstinence, slight doses of medicine and other simple means of relieving the system. Their principal mode of preventing illness was attention to regimen and diet.

Unfortunately, however, we have no records of the remedies or surgical proceedings used for dental diseases, except what knowledge we have gained from study of the mummies.

In the Peabody Museum of Harvard University, I was fortunate enough to be able to examine about 250 skeletons of the ancient Egyptians. These are either predynastic or belonged to the old or middle empires, all of which periods were prior to the records of the laws and customs just described. The predynastic Egyptian findings are from a period dating from 4800 B. C. back for an unknown length of time. The Old Empire is generally believed to have existed between 2500 and 2200 B. C., while the Middle Empire lasted from 2200 to 2000 B. C. All the specimens, therefore, which I had occasion to look over were from a time when we have reason to suppose that the medical laws were not developed as in the time of Herodotus, though we know that their sanitary laws dated back for a considerable length of time and it is believed that at a very early date they had frequent recourse to diet, emetics and numerous simple drugs concocted from the herbs which grew plentifully along the Nile and which they had discovered to be efficacious. One of the jaws which belonged to an individual during the Middle Empire shows, however, what perhaps may be an evidence of surgical treatment of an alveolar abscess and will be described later.

While in more recent skulls, evidence of fillings with gold has been found, no such treatment could be discovered in this collection, although the various specimens give us a great deal of information in what may be called pathological anthropology.

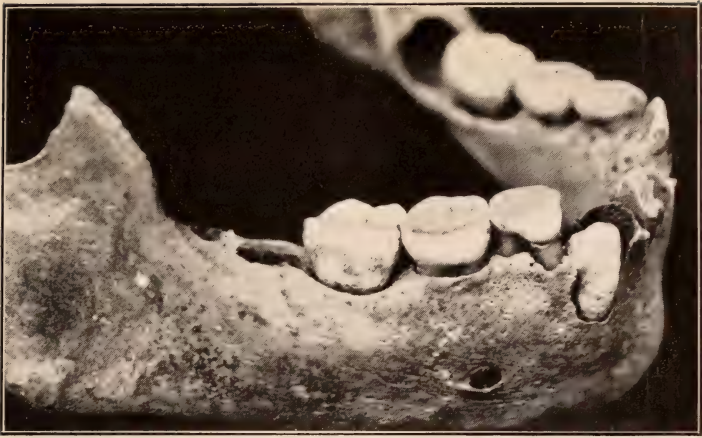


FIGURE 1.

Ancient Egyptian, Middle Empire. Jaw of a child about nine years of age. Note that the temporary teeth show no decay and have been worn down by the mastication of hard food.



FIGURE 2.

Predynastic Egyptian. Palatal surface of an upper jaw. The teeth have been worn in an oblique direction, probably due to malocclusion. In the right upper molar, the pulp chamber has become exposed and an abscess has occurred at the palatal root.



FIGURE 3.

Predynastic Egyptian. Alveolar process showing abrasion. The pulp chamber of the left upper first molar has become entirely exposed.



FIGURE 4.

Same as Fig. 3. Showing destruction of bone, due to abscess formation of the left upper molar.

In modern times, when our food is made soft by preparation, we frequently hear that many of our dental troubles come from lack of proper use of our teeth, but it is very strongly evidenced that the ancient people suffered a great deal from exactly the opposite cause; that is, the over-use of the teeth by mastication of very hard food, which had to be chewed vigorously and for a long time. We find abrasion not only in the skulls of the old people, but on the temporary teeth of children.

Figure 1 shows the lower jaw of a child about 9 years old. None of the temporary teeth show any decay, but the temporary molars have worn down considerably, due to masticating hard food. This skull is from the Middle Empire. Quite frequently the teeth had worn down to such an extent that the pulp became involved and enormous suppurative destruction sometimes followed. Such conditions are found in great numbers and apparently it was not evident to the people of those times that extraction of the tooth would have speedily cured the trouble.

The occlusal surfaces have usually worn down evenly, but occasionally we find a mouth in which the teeth have worn obliquely, such as is seen in Figure 2. This condition is probably due to malocclusion. The skull is from the predynastic period. Some of the teeth have worn so badly that the pulp has been affected and in this picture one abscess shows at the palatal root of the upper molar.

Another example of abrasion is found in Figures 3 and 4, specimens from the predynastic period. Figure 3 shows the palatal surface of the tooth with the roof of the pulp chamber gone entirely in the left upper first molar. The infection which occurred caused the abscess condition seen in Figure 4, a side view of the same skull, showing loss of bone due to the inflammatory process.

Figure 5 is a picture of a mandible from the Middle Empire, displaying the occlusal surfaces of the teeth. On the right lower first molar one can see a tiny hole where the mesio-lingual horn of the pulp has become exposed. The side view, Figure 6, shows two holes, one between the two roots and one between the mesial root and the second bicuspid. These holes are interesting as they look very artificial to me, especially the one between the bi-

cuspid and molar. It does not seem probable that the inflammatory process would have caused two holes of identical size with an upward inclination of the channel, and I should like to advance the theory that at least one of the holes, if not both, indicate a surgical procedure to give drainage to the pus which had accumulated inside the bone. I should be pleased if other men who have had experience in this line would make a careful examination of this specimen and express their opinion. An x-ray of the jaw, as seen in Figure 7, demonstrates that a large amount of bone has been lost around the roots of the molar, representing the destructive process of the abscess. It also shows well the outline of the pulp chamber and the place where the tooth was worn down so that the pulp was involved.

We very often find specimens where the abscesses have been of more violent character, destroying a large amount of bone. Such a condition is seen in Figure 8. It is impossible to say whether the missing molars which could not be found with the rest of the skeleton had been extracted, or whether they were lost during the ages. The skull, which is from the Middle Empire, shows the large amount of destruction, and I presume that the individual either died from this infection, or that the condition continued and progressed as a chronic inflammatory process, there being no sign of regeneration of bone, which would undoubtedly have occurred had the teeth been extracted.

There is very little evidence of decay. It is true that of many teeth we find nothing left but the root, but there are no signs to indicate that the loss was occasioned by decay, while there is good proof that the condition developed from use and we might even suppose that after the crown had been lost to a certain extent, the remainder of the tooth was shortened by artificial means. Among the many specimens examined, there were only two jaws which showed decay and in each of these there was only one tooth affected. Both are from the predynastic period and the jaw of one is illustrated in Figure 9. It shows decay of a 12-year molar belonging to an individual about 18 or 20 years old. The wisdom teeth have not yet erupted, but are about to break through the bone.

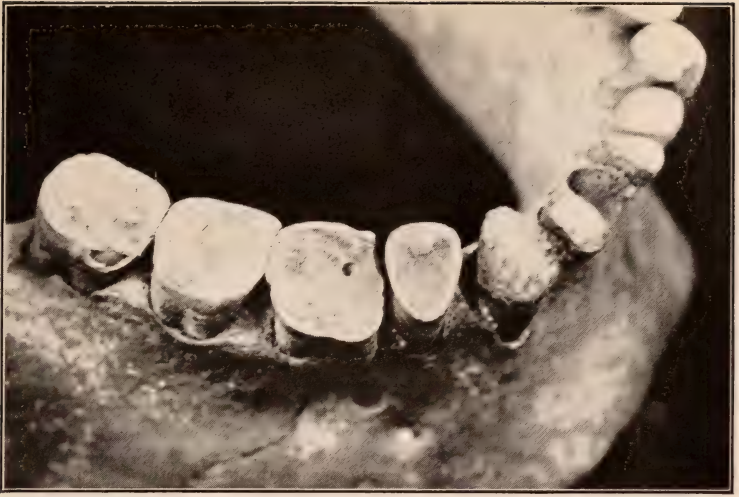


FIG. 5.

Ancient Egyptian, Middle Empire. Mandible showing abrasion on the right lower first molar. A tiny hole is shown where the mesio-lingual horn of the pulp has become exposed.



FIGURE 6.

Same as Fig. 5. Side view of mandible showing two holes, one between the two roots of the first molar and one between the mesial root and the bicuspid. These holes look artificial and may indicate a surgical procedure to give drainage to the pus.

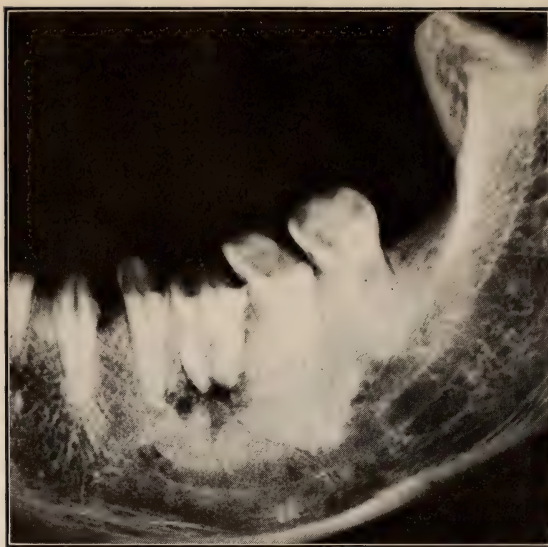


FIGURE 7.

Same as Fig. 5. Roentgenogram of same mandible, showing the abscess area and also the position of the holes.

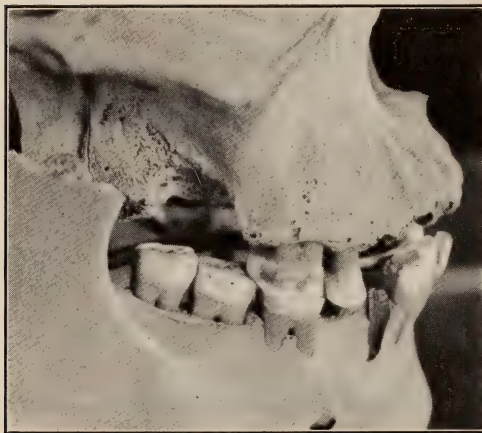


FIGURE 8.

Ancient Egyptian, Middle Empire. Skull showing large destruction in the right upper molar region.

Impacted and unerupted teeth, which are also more or less looked upon as products of modern days, are found to have occurred even in the predynastic Egyptian period. Figure 10 shows the palatal aspect of the upper jaw of an adult with an unerupted cuspid, the tip of which is just protruding through the bone. Another predynastic specimen shows two lower impacted wisdom teeth, as seen in Figure 11.

The Greeks undoubtedly gained their knowledge of medical treatment from the Egyptians. One of the oldest and most prominent writers and accurate observers is Hippocrates, who was born 460 B. C. He was a lineal descendent of Esculapius and the most celebrated physician of antiquity. He left definite accounts in various parts of his works and mentions the principal diseases of the teeth and the plan of treating them, both by manual operations and dentifrices.

In these writings he gives great prominence to the treatment of dislocated jaws. The symptoms he describes as protrusion and distortion of the side opposite the dislocation, together with inability of the patient to shut his mouth. When the jaw is dislocated on both sides, he says there is no distortion but it protrudes more and the condition may be recognized by the relation of the lower teeth to the upper. As treatment he advises the following; the patient is laid down or seated. The doctor takes his head and grasping both sides of the jaw bone with both hands within and without, he performs three maneuvers: rectifies the position of the jaw, pushes it backward and shuts the mouth. Soothing applications and supporting bandages are then applied. The ancient scientist then concludes the subject by saying, "If both sides be dislocated and not reduced immediately, the patient dies on the tenth day with symptoms of fever, stupor and coma." This development was probably due to involvement of the brain.

Referring to infection of the joints, which must have been quite frequent, Hippocrates says that febrile diseases with lassitude are sometimes accompanied by deposits about the joints, especially those of the jaws.

He also describes two types of necrosis; that of the palatal bone, which resembles destructions due to syphilis, and another

type connected with exfoliation of the teeth, pyorrhea alveolaris. He is quoted as follows: "In cases where the bone of the palate has exfoliated, the nose sinks in its middle, but in those in which the sloughing is about the teeth, the ridge is flattened."

A great deal more trouble must have occurred in those times during the period of dentition and this process must frequently have been complicated by acute infection accompanied by serious systemic diseases. Of this trouble, Hippocrates writes as follows: "At the approach of dentition, puritis of the gums (*gingivarum exulcerationes*) occurs and fevers, convulsions and diarrhea, especially when cutting the canine teeth and in those who are particularly fat."

The Romans in turn derived their knowledge from the Greeks. They seem to have suffered from various oral diseases, as might be expected of a people who made so much of eating and feasting. Celsius, who lived from 30 B. C. to 45 A. D., and was a celebrated physician in Rome, left in his records the treatment of several important diseases of the teeth. He describes scraping, filling with gold and extraction of teeth. He also treated the scarifying of the gums and fixed loose teeth with gold wire, which shows that the Romans in the Christian era, not only suffered from caries, but also from pyorrhea alveolaris.

If we turn our attention to the New World, we find one of the most interesting nations to be the ancient Peruvians. There is a large collection of their skeletons at the Peabody Museum, which demonstrate that they suffered severely from dental disturbances.

They made little progress towards civilization and lived in a climate which was unhealthful, which accounts for their many diseases and slow development in the medical sciences. They seem, however, to have had some knowledge of the subject, as is shown by evidences on the skulls which have been found, where they treated wounds such as might have been caused in fighting, by trephining the bone. That they have been successful in many instances is proved by the fact that skulls have been found which undoubtedly had formed new bone.

The skulls are mostly from the Chimu and Aymara tribes, who were the most completely isolated of all the Peruvian people,



FIGURE 9.

Predynastic Egyptian. Jaw of person about eighteen or nineteen years old, showing decay at the occlusal surface of the left lower second molar.

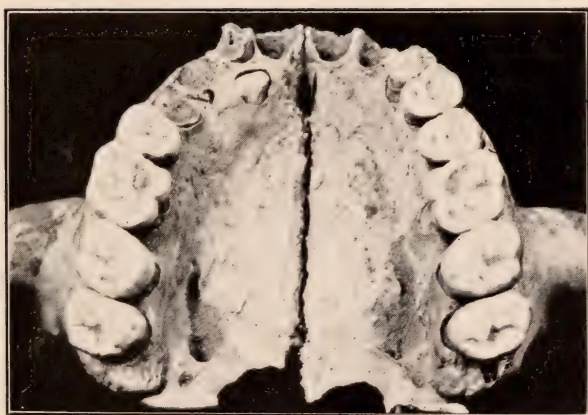


FIGURE 10.

Predynastic Egyptian. Upper jaw showing an unerupted cuspid at the anterior part of the palatal surface.



FIGURE 11.
Predynastic Egyptian. Mandible with two lower impacted wisdom teeth.



FIGURE 12.
Ancient Peruvian. Showing many indications of abscess conditions.



FIGURE 13.
Ancient Peruvian. Skull showing enormous destruction of the alveolar process and incisor region.



FIGURE 14.
Ancient Peruvian. Skull of adult, showing an unerupted cuspid.



FIGURE 15.
Ancient Peruvian. Skull showing a cuspid which has erupted from the zygomatic process of the maxilla.



FIGURE 16.

Ancient Peruvian. Skull showing malposition upper third molar facing toward the buccal side.



FIGURE 17.

Ancient Peruvian. Skull showing evidence of cleft palate and hairlip. The entire premaxillary bone is missing. The palatal processes of the maxillary bones have failed to unite.



FIGURE 14.
Ancient Peruvian. Skull of adult, showing an unerupted cuspid.



FIGURE 15.
Ancient Peruvian. Skull showing a cuspid which has erupted from the zygomatic process of the maxilla.



FIGURE 16.

Ancient Peruvian. Skull showing malposition upper third molar facing toward the buccal side.

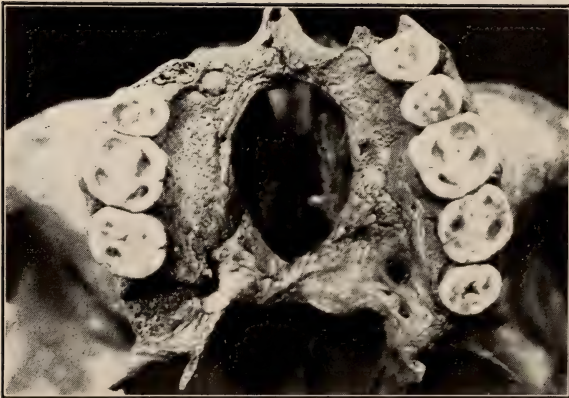


FIGURE 17.

Ancient Peruvian. Skull showing evidence of cleft palate and hairlip. The entire premaxillary bone is missing. The palatal processes of the maxillary bones have failed to unite.

because of the bad climate and their hostility to all strangers.

They had a custom of flattening the skulls of their own children by means of tight wool caps, put on at birth and left indefinitely. The conditions under which they lived were extremely unsanitary, many families being herded together in one rude hut, which bred degeneracy among them. In addition to this they were cannibals. After a battle, they brought home the women of the captured tribe, whose children they raised carefully to the age of 10 or 12, when they ate them. Judging from the condition of their teeth, as seen in the skulls, this diet evidently did not agree with them very well.

They suffered a great deal from abscesses of the jaws, as shown in Figure 12, where there are many indications of abscess conditions, not only on the remaining bicuspid roots in the upper jaw, but also on the places where the teeth have been lost.

Figure 13 shows enormous destruction of the alveolar process in the incisor region of the upper jaw, which is probably due to an inflammatory condition. Apparently no attempt to cure by extraction had been made, as there is no evidence of healing. The patient evidently died immediately or the condition continued as a chronic abscess, the teeth having been lost after death.

The Peruvians also had many irregularities in the eruption of the teeth. From 119 specimens which I looked over, I found 6 with irregular eruptions. One specimen showed two supernumerary teeth on the palatal side of the cuspid region. Only the tip of the cusps were visible and it is hard to say whether they are simple back teeth or bicuspids. Figure 14 shows the skull of an adult with an unerupted cuspid, the buccal surface of which is visible through the bone. Another presents a cuspid which is erupted from the zygomatic process of the maxilla towards the buccal side. This is probably due to a displacement of the tooth germ and is shown in Figure 15. An upper wisdom tooth can be seen in Figure 16. This tooth has grown towards the buccal side instead of downwards in its natural position.

A very interesting specimen is presented in Figure 17. This also is an ancient Peruvian and there is evidence of a cleft palate and hairlip. The palate shows a large perforation of the palatal processes of the maxillary bones, and this being of very regular

shape and giving no indication of necrosis, leads to the supposition that it was a result of congenital failure of union. The premaxillary bone in this specimen is entirely absent, a condition which was probably accompanied by a double hairlip.

The knowledge which has been left to us by some of the writers of antiquity seems scant in the light of more modern discoveries, but we must remember that very few of the important men of those ages were able to write, and those who could were not always interested in the science of healing. However, the records which we have from the study of anthropology give us an opportunity to study the diseases of the teeth and jaws of ancient peoples back to times of which we have no written knowledge or contemporary history whatever.

It was the writer's intention to contribute in a modest way to the knowledge of the dental diseases of these ancient nations, with the hope of encouraging other men to study any specimens which may be at their disposal. This would lead finally to a more extensive understanding of many interesting facts about the diseases and therapeutics of the teeth and gums of those times.

Before closing, I should like to express my appreciation to Professor Frederick Ward Putnam and Dr. E. A. Hooton of the Peabody Museum of Harvard University for their generous assistance in getting the material for this paper.

43 Bay State Road,
Boston, Mass.

THE PSYCHOLOGY OF WINNING AND HOLDING THE CONFIDENCE OF THE PATIENT¹

By STEWART ANDERSON, Springfield, Mass.

THE task that I was invited to undertake is to bring to your view a few of the things that modern business is successfully using to extend its service, and to try to find whether or not they have or could have a place in the dentist's endeavor to extend his service. As some of these things are designed to influence the customer or the patient by reaching his mind through an appeal both to his sensibilities and his reasoning faculty, builders of business assert that they rightfully belong to the realm of psychology. If that is true, and if the dental patient is influenced or may be influenced by means similar to those that influence the customer, then a part of what I am to say may properly be termed "The Psychology of Dentistry." But in presenting it to you I shall be content with a less than professional status, and shall avail myself of the latitude that your lenience would grant to one the commonplace title of whose address was, "Through the Eyes of a Layman."

I have been a dental layman—lying periodically in a dentist's chair—for forty-five years, and therefore have had ample opportunity to observe, and reason enough to reflect upon, dental methods and dental personalities and dental environments. Also, I have been connected with salesmanship for many years. And many a time my mind has leaped from the one to the other.

Business commands one great instrument for extending its service that is denied to you. Business advertises. You may not, you will not. Yet the dentist desires to create a practice or to extend his practice. His influence must be exerted by silent methods, and his instruments are, what?—good work and reasonable fees? Only these? No! Should we not add others to them, beginning with personality and personality skill? By

¹ Read before the Massachusetts Dental Society, Springfield, Mass., May 4, 1917.

personality I mean the dentist's own visible self—the self the patient sees. By personality skill, I mean his knowledge of the diverse personality of his patients, and his adeptness in so playing the elements of his own personality upon the varied features of his patients' personality as to cause them to give him their implicit confidence.

All of you have heard the phrase "scientific salesmanship" or "the psychology of salesmanship." Perhaps all of you do not know that there are schools in which salesmanship is taught, for a price, and that many of the great industries maintain schools of salesmanship for the instruction of their prospective salesmen. In these schools personality and personality skill are among the foremost studies. Here is the reason: Among six men to whom a salesman presents his proposition there may be six types of personalities. Now, the salesman's aim is to enter the "prospect's" mind by the shortest cut and the easiest approach, that he may possess it and subdue it to his desire. But the shortest cut and the easiest approach to the mind of one of these six types may not be the shortest cut and the easiest approach to the mind of any of the other five. One man may be reached by touching one of several emotions, the second by touching another emotion, the third by an appeal to judgment, and so on. And therefore the salesman is trained to know types of personality and to use what is called "the right approach." Knowing personality types, however, is not enough. He must know the resources of his own personality, and must become facile in using them. His personality is as a tool box, which should be rich in its assortment of the best tools, each in its place and ready for instant use. He needs the tool of logic, the tool of sympathy, the tool of humor, of honest craftiness, the tool of imagination, the tool of good fellowship, and many others; in short, his personality should contain whatever tool is required to successfully combat any type of prospective customer. And men grow wondrously skilled in this use of personality. Even the dullest man grows proficient through experience, but the salesman's progress is much more rapid if, before he began his work, his eyes were opened to personality types and he acquired this tool box of personality.

There is a saying that "every man is a salesman." If so, the dentist is a salesman. He is trying to sell, not the filling of a single cavity, but continuous service. His patients have diverse personalities, and this variety is partly common and partly due to sex and age and physical or nervous condition. The wise dentist does not meet the robust man with the same demeanor that he greets the nerve-wrecked woman or the frightened child. This is elemental psychology, if it be psychology, such as the salesman practises. Nor does he treat alike all boys, or all girls, or all women, or all men. By his varying attitude or approach he acknowledges his recognition of diverse types in each class. That, too, is psychology, as business terms it, although he may not think of it by that name. I imagine that the dentist, in respect to the attitude of his patients toward operations, has to combat, in the young, fear of prospective pain, and, in many adults, both fear of prospective pain and apprehension over the possible physical or nervous results of pain. And is it not reasonable to assume that the deeper he is able to enter into the minds of the diverse types of these classes of patients, and the more skilled he is in applying from his own personality the varied remedial agencies of sympathy, or reassurance, or divertisement, or appeal, or argument, or authoritativeness, the more successful he will be in attaching to himself the patient, or even the whole family, if the patient be a difficult boy, an unreasonable girl, or a notional or nerve-ried woman? The giving of prophylactic instruction, and the imposing of prophylactic duty upon patients, is part of dental service. The inducement to heed and obey doubtless varies according to class and to types within a class. Billy Jones, eight years old and indifferent to sanitation and conservation and every other "ation," would not be impressed by the inducement that would make his sister Sue, age seventeen and enough said, avid in listening and slavish in performing. And father would turn up his nose at the reason for teeth preservation held out by the dentist to red-lipped Sue. There must be "the right approach" in each case. Moreover, to be to the highest degree efficient, whether as operator or hygienic instructor, the dentist should know more types of boy than two or three, or of girl, or of man, or of woman.

And to acquire this knowledge, a first requisite is to get it out of his mind that everybody else feels as he does and reasons as he does. The salesman and the advertising man are successful because they know that personality is diverse, have schooled themselves to see from the other man's viewpoint, and have made themselves so adaptable that they can either steal into or strike into any personality they wish to capture. An unchanging attitude of hauteur, air of omniscience, and voice of a bulldog or a bull, whether in dentist or in physician, may for a time build reputation, but in the long run will fail unless also there is skill so great as to offset these disqualifications. And they are not much use in comforting a terrified child or in soothing a neurasthenic woman. Sympathetically and tactfully leading the patient to calmness of mind or clearness of understanding; is not that more sensible and more fruitful than attempting to overawe with a presence of aloof "know-it-all-ness" and "I-am-it-ness?"

I have used many sentences with perhaps little coherence or sequence, in an attempt to discover whether or not personality and personality skill—prized requisites of successful business salesmanship—are essential to highly efficient salesmanship of dentistry. I think they are essential, and that the dentist who is easily and sufficiently responsive to type varieties is far more likely to build a practice or to extend his practice, than is his brother whose skill equals his but who lacks the personality equipment. Building a practice and extending a practice is not, however, the chief reason for personality efficiency. Service, in the highest, the ethical sense of the term, demands it, as later I shall try to show, drawing again from business example.

The cultivating of personality is a process of elimination and of providing.

Let me give an example or two of elimination. A man may have a quality that is repugnant to others, such as an overpowering love of argument. He is not willing that any other man shall in his presence hold a differing opinion from his own on any subject. But a man likes his own opinion, and becomes hostile to him who is contemptuous of it. Hence, the salesman who rides roughshod over his prospective customer's opinion

is liable to find prospective changed to retrospective. His duty was to *sell* to that man, but he loved his own domineering way so well that he forgot his duty in the indulgence, not of his strength, but of his weakness. Such a salesman must first have a mirror held up to him, that he may see his fault, and then must resolutely and watchfully eliminate it, for his duty is to triumph in selling and not in indiscriminate argumentation. I can imagine that a dentist could argue a patient off his books, over some trivial matter. Let the patient believe the moon is made of green cheese, if he wishes—that is his inalienable right. Is not your duty to care for his teeth, rather than to be the framer of his opinion on any other subject?

Procrastination is a common vice or weakness. The salesman who habitually delays frequently loses. So he is taught to be prompt and forehanded, lest the other man be first with the prospect. And he is instructed to smash instantly each "do it later" impulse, until the fault is eradicated. Does the dentist, in his operating room, always realize the business man's esteem for promptness? Nervous mannerisms, that set customers on edge, are sometimes seen. The salesman is told to search his personality for such faults and to cast them out. Sometimes he has an irritating or repelling physical aspect, of person or of clothing. He is advised to rid himself of it. These are samples of elimination.

Let me now give an example or two of providing. Perhaps the salesman lacks self-confidence, and fears to approach men. It must be supplied by suggestion and by practice. The power of clear statement may be so far absent that the prospective customer either does not receive a convincing statement of why he should buy what is to be sold, or else he is wearied by meandering sentences. And so the salesman is drilled in the art of shaping selling arguments tersely and with cumulative force. Clear statement is a delight, whether to a dental or a commercial customer.

Through expert training, the salesman's weak points are strengthened, his destructive faults are removed, and natural qualities of strength are disciplined and put under control; and his personality is transformed into a machine for the efficient

doing of his work of salesmanship. Is there not a profitable suggestion for the dentist in the salesman's preparation?—especially if he is young and his mind is pliant, and his energy abounding, and his goal is afar off and glorious with the idealism of his soul's desire to pour into his life's work all that his being can yield?

Business rates highly the effect of orderliness upon prospective customers. Just one example. If you go to a store and ask to see an article that should be within immediate reach, but is not, or if a salesman comes to your office and turns over and over and over all the samples in his bag in an effort to find the article he has been describing to you—and whether in store or in your office excuses, stammering or voluble, are made while the hunt is going on—you grow impatient and are liable to form an instant adverse judgment upon the store or house, and, illogically, upon the goods. Such is human nature. The goods are doubtless all right, and only the system or salesman is wrong. If the skilled dentist, during the course of an operation, is obliged to fumble and search for his instruments, to the accompaniment of sighs or finger snapping, while his patient is doing his best not to swallow the dam rubber that is maddening him, is it not possible that though the results of the operation are satisfactory, the operation itself may have been so disagreeable, through the lack of simple orderliness, that the patient will betake himself elsewhere? When a man or a woman is suffering, or is under a nervous strain, a slight unnecessary discomfort may create an immediate adverse judgment.

Business is fond of using the word "demonstration," to describe either a public or a private exhibiting of goods or mechanisms, and the demonstration is always carefully prepared, so that the best possible impression shall be made upon the audience or the individual. Let me consider a patient's first engagement with a dentist as the dentist's demonstration. Suppose he is careless in the use of his instruments—that they slip from tooth to gum and either cut or irritate, that he drives his drill into a Gahenna of pain without a quiet word of warning, or that he snaps his saliva pump roughly into the patient's mouth. Such a demonstration would in many cases result in

the non-return of the patient, even if it did not cause to go elsewhere those who might have become patients, had his report been favorable.

Business is more and more emphasizing the value of courtesy, both in the organization and toward customers little and big, unreasonable and reasonable. What impression is made on the business-man patient by the operator who, in the same tone of voice that he would use to a horse, a dog, or a tramp, gives his orders to his young woman assistant during the course of an operation? Even though it were professional, which, of course, it is not, a dentist's office is a salesroom and not a clinic.

Business pays great attention to appearance—of front windows, of counters, of shelves. Attractive and clean they must be. And I do not think that in the rest room of a first-class department store the magazines, if they were supplied, would be too ancient or much soiled or badly torn. Why? The store managers know that some people would think that similar indifference characterized the selling and delivering of the merchandize. The selling and delivering are probably all right, as the dentist's work would probably be all right, but there is the liability of a wrong impression being made on prospective customers.

An art shop would not decorate its walls with whitewash or with paint of a color that is common in a hardware shop. A seller of corsets or women's gloves or perfumes does not send out the blunt, bold advertising matter that the bank issues. The decoration and the printed matter are suited to the kind of business and kind of customers. In a place where pain and raging nerves and fear and apprehension are every hour experienced, should not the walls be free of jarring or accentuating influence, and, instead, be made to exert a soothing influence? Gay colors or chaotic and inharmonious color schemes surely do distress those who are mature enough to have a sense of value in colors, and doubtless they may have an adverse effect upon younger patients. There is plenty of testimony to show that wild wall paper causes a harmful reaction, as well as that non-antagonizing colors are helpful. Business is careful

of these things. It knows their power, even as you do. And the successful business man knows that if he is not careful, a competitor will be, and will profit at his expense.

Business values the pleasing voice, to an increasing degree. The snappy-voiced or whining-voiced or nasal-voiced telephone operator is not so common nowadays as once. Why? Business has learned that the public regarded these young ladies as heralds of their respective businesses, and that their tone and manner was a proclamation and a revelation of the tone and manner of the house itself. If the young lady was impertinent or indifferent, so was the house, the public reasoned; if the young lady was courteous and alert, so was the house. And if the impertinent young lady's voice lived in her nose or it had a shrill squeak, her riling power was greatly increased. On the other hand, if the courteous and alert young lady's voice was pleasing, the good impression she made for her house was deepened. Business nowadays is hunting for waste, vigilant to find the loose ends. And the telephone answerer has been found to be a person of too great consequence for indifferent choosing.

But business regards other than telephone voices. The voices of salesmen are being trained in the salesmanship schools. Why? Well—how much chance would an unkempt salesman have of selling to you?—a man who needed a shave, whose linen was soiled, whose shoes were shineless? Not half as good a chance as the well-dressed man. Again, why? Because the eye delights in beauty or demands observance of the current standard of appearance. So likewise the ear delights in beauty and demands observance of the current standard of vocal appearance. Hence the man with the noisy voice offends you, the man with the rasping voice affects you as does a fork quickly drawn across a tin pan, and the man with the mumbling voice and unshaped syllables irritates you. The offended or irritated prospect is very liable not to become a customer. The keenness of competition is forcing business to be increasingly efficient, and it is doing all it can to stop such salesmanic waste as results from faulty voices.

If there is any dentist here who believes that a pleasing voice would be an asset to him—both because it would be a help in

handling the young or the nerve-troubled, and because it would be a profitable personal attraction—but who has the erroneous opinion that the pleasing voice is born and cannot be made, let me assure him that every man and every woman who is still young enough to be physically plastic can have a pleasing voice, if the vocal organs are normal and if a few months' of faithful daily practice is had. There is no need to take lessons for a long period. The only need for lessons is that of placing the voice—dragging it up from the throat, or forward from the cavern of the mouth, or down from the nose (although, correctly speaking, it never is in the nose), and giving it in charge of lips and teeth and tip of tongue. A few lessons will suffice, and then practice must complete the work. The voice grows strong and pleasing and obedient through exercise, just as the arm becomes strong and obedient through exercise. May I suggest to the young dentist that he keep his ear open toward the voices of those with whom he mingles, that he note their effect upon him, and that he then decide for himself whether or not business is wise in looking after the voices of its salesmen and whether or not a pleasing voice is valuable to a dentist and a repellant voice is a hindrance.

The few things that I have taken you to view—much as if you were viewing Springfield from a “seeing Springfield” auto—are in the schedule of things that business has put together under the label of “Psychology of Salesmanship.” At worst, I have merely wasted your time and mine if in them there is nothing that dentistry can use or nothing that dentistry is not using; at best, possibly some, absorbed in their profession, and not in near touch with business, may gain a hint or a thought that they can use to their profit—to the increasing of their efficiency and their consequent power to serve themselves, their patients, and society.

And now, gentlemen, permit me to take off my shoes and tread for a moment on holy ground, even though I know beforehand that what I shall say will be futile. The theme will be publicity, not advertising. I apprehend that every worthy dentist continuously, or at times, regards himself as a social servant, and none knows better than he how much society needs his

service. That being true, should not the dental profession keep before the public, through the newspapers, the value of sound teeth and the due consequence of neglect of the teeth? You work in the public schools, and in other places, as social servants meeting a social need. You will tell a church club audience or a school audience things they ought to know about the teeth. You admit that more of the public ought to be educated dental-wise. Yet you, as social servants, neglect the greatest publicity instrumentality that can be commanded. I respect your respect for your profession, I admire your reverence for its dignity. But I cannot help wondering, if so sacred an institution as the church, that it may do the Father's business, may properly use paid publicity, why the dental profession should not do it too. Do not misunderstand me. I am speaking of paid publicity, which may be not at all paid advertising. Suppose that once a week the dentists of any Massachusetts town or city should, in the advertising columns of their local paper or papers, preach an informative, instructive, cautionary dental sermonette, over the signature of their dental association,—would such publicity be unethical in spirit? Would it in anywise lower the popular respect for your profession? Would it diminish your own proper self-esteem? I do not think so, not even though the sermonette were surrounded by the names of the members of the organization. The public thought would be turned toward teeth and health, the people would be reminded that you have organizations that guard the honor and guide the progress of your profession, and, in addition, the goats would be branded by their exclusion from your publicity company. I reiterate that I know my suggestion to be futile, but I thank you for listening to it, and now I put on my shoes again and remove myself to other ground.

Briefly let me speak of two other things that business is doing, and then I will give way. Business was never so eager to find new machines and new methods for extending its service. The man with an idea is given the right of way. The marvels of invention that have so enriched the life of this generation have taught business to keep an open mind and maintain an encouraging attitude toward what is new. As a consequence, the

head of a great business doesn't sneer when told that a new thing has been devised or is in the process of development. He is at least judicial. I assume that this is the spirit of your profession, and that the man who invents a new operation or improves an existing operation, or who devises a new mechanical process, or who discovers a new remedial agent, and makes it known to his fellow-practitioners, that they may be helped in their work, and that their patients may be benefited, receives fraternal encouragement and praise and is not accorded such treatment as in times gone by killed the soul of many a man whose invention afterwards blessed humanity. Business has broadened, and generally, but not yet universally, is good to the man with the idea.

Finally, in recent years business had become dominated by a new spirit. No longer the public service organizations maintain a "public-be-damned" attitude. They advertise their eager desire to serve the public. Commercial corporations have discovered that their duty is to serve the public, as well as to make profit. Business organizations, such as Chambers of Commerce, Advertising Clubs, Rotary Clubs, Commercial Travelers Clubs, and many influential business magazines, are ceaselessly teaching that the right of business to exist and profit depends on the extent and quality of its service. Slowly but surely there has entered the public consciousness the truth that all of us are servants of society, that none can live or ought to live for himself alone, and that both the highest welfare of society and the best development of the individual can be attained only when all are fully responsive to what is called "the spirit of Service." And it is this spirit, at least as much as the desire for profit, or ambition for supremacy, or the struggle for self-preservation, that impels business to seek and to use means for increasing efficiency. For increased efficiency means closer obedience to the social command that all shall serve with the best of their powers. Your profession holds a high place in social service. It would be an affront to any man among you if I should say otherwise. And, therefore, the most I would do is to invite you to note that efficiency has a close ethical relation to your membership in the human family as well as to the high ideals of your noble profession.

THE BUSINESS SIDE OF DENTAL PRACTICE.¹

By P. R. KIRCHNER, Springfield, Mass.

I AM discussing the business side of your professional life and the system necessary whereby you can ascertain at a glance, from the records kept, just where you stand financially at any given period.

I find in looking into the education of the student at the various dental colleges, that the question of handling that important part of one's professional work, namely, the money end, is sadly neglected. As you know, the student is instructed most thoroughly in theory, technic and the practical or mechanical procedures. The next step is the State Board examination, after which comes the question of proper equipment.

Now comes the first business problems of your chosen life's work. You know what is required to turn out first-class work and give efficient, clean service. The education has cost considerable capital and I believe I am safe in saying that 80% of the young dentists when ready to open their offices are forced to do so on the popular Ritter or White plan of 15% of the total amount of the purchase price in cash and the balance in monthly notes at the rate of 3%, with interest.

The cost of the bare necessities of an up-to-date office, including chair, electric engine, cabinet, cuspidor, bracket and table, lathe and bench is approximately \$700.00, 15% per cent of this amount in cash is \$105.00, leaving a balance to pay of \$595.00 at 3%. A payment is necessary of over \$18.00 each month, including the interest for a period of 33 months. These figures, of course, do not include instruments and supplies, which are absolutely necessary before the first patient can be attended to.

The dentist at this stage, knowing what his equipment, tele-

¹ Read before the annual meeting of the Massachusetts Dental Society, Springfield, Mass., May 3-5, 1917.

phone, electric light, gas and other small incidentals contracted for, amount to—and the amount of salary he should draw from the business—is in a position to figure his overhead expenses for the year, month and week and can quickly ascertain the number of hours he should work each day and the rate per hour his services must be charged; thereby placing himself in a position to meet his obligations at maturity. The dentists to-day are few and far between who can tell offhand their overhead expenses—exclusive of supplies. The dental office must be run on business principles, and the man who does not know what his burden or dead loss expenses are, is sure to find himself in financial difficulties before he has practised very long. Get a line on what it costs to do business, thereby placing yourself in a position to curtail expenses when business is quiet.

The business policy of the average dentist has been wholly inadequate for half a century and I might remark here that the profession as a whole is considered by credit men as the poorest of risks; and from the insurance companies' standpoint you are regarded only as a second class risk. On account of working over people with all kinds of diseases, they, the insurance companies, claim that your liability to contagion and infection is heightened, which is true. Your death rate, therefore, is somewhat higher than other vocations and as a rule you do not live as long.

Your work is purely personal and when you stop the income ceases. The overhead expenses go on and the office is non-productive, so it behooves you to arrive at—by careful studying and figuring—just what you should charge for your work per hour and adhere strictly to the figures derived. That old adage, "It is never too late to mend" covers your case positively and I say now, "Stop, study and figure!" Put your office on a paying basis by the proper adjustment of fees. The public, by the attitude of your predecessors, have and still are "shopping" when dentistry is necessary. They, the public, are inclined and do tell you what they pay. When a person receives a bill for professional services from an M. D. do they go to him and say, "You, Doctor, have charged me too much. Doctor So-and-So would do the same work for so many dollars less?" They do not.

And yet, you allow the public to shop by not having expenses more closely figured, which would place you all on a more uniform basis, and make conditions better all around. All other lines of business force the buyer to pay the overhead expenses and a profit. Your chosen life's work should be on the same basis of figuring and until you get away from the antiquated way, and modernize, your general credit standing as a whole will remain the same, namely, a very poor risk.

There are all kinds of dental bookkeeping systems on the market. The Dentists' Supply Co. has recently put out a columnar journal which is segregated, thereby giving the business a total of the different classes of work done and the amount of money each department has earned for the period. To my mind this is a fine, compact record, but I believe it is too complicated for inexperienced handling. A cash book is the key to the whole situation and next to the card record of patients' accounts is the most important book or record of information in the office. I have had a printer draw off for me a large sheet with the proper cash book rulings, which I will endeavor to explain the use of at this time.

We will take, for example, a patient having uncompleted work, who makes a payment of \$5.00 on account. May 1st—John Smith—\$5.00. We next have an unknown patient who has an extraction and a charge is made of \$1.00. This we enter as cash or extraction, \$1.00 on account; completed work, Sam Jones, \$2.50. These are all the cash transactions for the day. Now, in any regular line of commercial business, a deposit to the bank is made each day of the previous day's receipts, and this should also be done by the dentists. I am sorry to say that about 65% of the money which you collect is not put into the bank but into your pockets. I might here cite an instance which helps drive home my point. A few months ago I was called upon by a dentist to install a system for the proper handling of his detail. The first thing I did was to ask for his present cash records. I found that his collections for the month amounted to \$383.00 and upon examination of his check book found that only \$163.00 of the amount collected had been banked. I asked where the balance of \$220.00 was, and he told me that he did not

know just how it had been spent. Now this doctor's practice was of fair size and his overhead expenses were quite large, and of the money collected \$277.00 should have gone for expenses, leaving him \$106.00 for his own personal bills and living expenses. Instead of having the money in the bank to pay the current accounts, he had pocketed the money, so his personal withdrawals from the business were \$220.00 instead of \$106.00. There was absolutely no way of telling what the man had been taking as a salary other than by subtracting the amount of money deposited from the amount collected. If you deposit all your collections and draw a personal check for personal needs, then the business has a record of all transactions and a line on the amount and frequency of the withdrawals by You, the Owner.

No business can be operated successfully by slipshod methods; and a tight string on the money received and disbursed and a record thereof is absolutely necessary.

On the opposite side we enter all expenditures for the day. For example, we give a check to Wm. M. Williams, Inc., check No. 245, amount \$18.70, for April supplies; telephone check No. 246—\$5.25; gold purchases, check No. 247—\$1.67, and a personal check for cash on personal account, \$15.00, check No. 248. On the morning of May 2nd we deposited the previous day's receipts as follows: May 2nd deposit \$8.50. At the end of the month we add up the cash column and it should equal the deposit column with the exception of the receipts for the last day of the month, which we deposit June 1st. We then add the disbursements. These totals of receipts and disbursements are then entered on our cash account in the ledger and the difference between the right or debit side and the left or credit side is the net cash worth of the business.

Each item on the receipts side of the cash book is individually posted to the patients' account and the amounts on the disbursements' side we charge to the proper accounts as specified on the cash book. If the proper record is made in the cash book covering expenditures, it is a very simple matter to charge it to the correct account in the record book of totals, which is called a ledger by bookkeepers.

A record of the business is necessary and this we keep in the ledger, a ruling of which I also have had enlarged and now submit for example. The most important is the cash account, which I will now explain. On May 1st the balance of cash on hand and in the bank, for example, is \$140.00. Our cash book shows for the month of May, receipts of \$460.00 and disbursements of \$580.00. We post these amounts to the ledger, which gives us a debit or charge to cash of \$600.00 and a credit on expenditures of \$580.00 and the difference is \$20.00, the balance of cash on hand. We charge on the right hand side of the ledger to the proper account the various expenditures, as shown on the cash book. For example, I will take the personal account. On May 1st you withdrew from the bank for personal use \$15.00. This amount is charged to your account in the ledger and by so doing each time a withdrawal is made you can tell at any time just how much you personally are spending from the business. An account should be kept for Supplies, Laboratory and General Office Expenses. I would also advise an account for journals and medical books, as it seems that quite an amount is spent in this way each year which is not ordinarily included in the overhead expenses as it should be. The general expense account should include rent, telephone, gas, electric light, postage and stationery.

Regarding the card record for patients' accounts, it is advisable to have a control on them so that you can tell at any time what is owed by the patients, as a whole, without going over and adding up the cards. This can be accomplished without much additional work and also gives you valuable information for a comparison basis. Retain the daily working card of each patient worked on for the day until the day's operations are all completed then total up that day's business, including any cash work that is done in the total. Enter this amount in a small memorandum book following the day and date. At the end of the month add the sum of the month's business to the previous month's record and you have the gross business. If you then subtract the amount of cash received during the month on account—getting these figures from the cash book—the result will give you the total of patients' cards or the Accounts Receivable. We must, therefore, have in our Ledger an account called Ac-

counts Receivable, in which we record this information. From the memorandum book we enter in the ledger under Sales, the amount of the business for the month. This account is of vital importance because by this account you can tell whether you are forging ahead or whether expenses should be curtailed.

Regarding the patients and the arrangements for settling the accounts, a hard and fast rule of settlement when work is completed is the sane and safe method. The arrangement regarding settlement should be made before the work is started and in the greater majority of cases a deposit should be asked for and an approximate idea given the patient as to what the work will cost and the time necessary to do the work. A statement of the account to charge patients should be mailed each month, even if the work is uncompleted. Very often if a patient, although the work was not completed, knew that his bill was "crawling up" as it does, he or she would remit on account. Then when the work was completed the account would not be of such proportion that payment of a few dollars a week for months is necessary.

There is no excuse for the profession to have open accounts amounting to \$1,500 to \$3,000 continuously, and the main fault lies with you for not enforcing payment on completion of work or within thirty days thereafter.

Another subject I might bring up at this time is the purchasing of supplies. Are you purchasing to the best advantage? Do you take advantage of the quantity rates on burs, cements and other goods used daily? Make every dollar obtain one hundred cents value. The "pack peddler" with his cheap prices and cheap goods is another question. You value your time at \$5.00 to \$10.00 an hour and yet you will spend fifteen to forty-five minutes looking over his goods and beating him down to save 50 or 75 cents and then brag to the dealers about the saving. The dealer carries a stock of goods for your selection, carries your account at all times 30 days and extends the credit when you are financially embarrassed. If you need supplies quickly you rush to the dental depot, and if they do not have the goods you need, they, the depot, endeavor, by telegraph or telephone, to get them by special delivery or express. You do not wait for the peddler when you are in a hurry nor do you buy anything of him when

you are broke. A dental depot makes only a fair margin of profit on their standard line of dental merchandise and your business, as a whole, should go where you get the service when you need the supplies immediately.

A man who will train himself to good business methods in the conduct of his practice will render better professional service to those who put their confidence in him.

In conclusion: Wake up, you professional men! and progress with the times. Systematize the business end of your office so that you can at a glance tell just where you stand; then when business is good you will positively know it and can accordingly spend more of the income if you are so inclined; but when business is bad you will know how and where you can curtail expenses and meet the business depression.

SYSTEMATIZING AND STANDARDIZING THE DENTAL CLINIC.¹

THE PRESENT WORK OF THE DENTAL HYGIENE COUNCIL OF
MASSACHUSETTS.

By EDWIN N. KENT, D.M.D., Boston, Mass.

To the President and Members of the Massachusetts Dental Society:

The Annual Report of the Dental Hygiene Council of Massachusetts is usually presented at a session of the Society's Councillors.

This year it is presented before the main body for two reasons:

1st. Because it deals with a subject which is just now of general interest.

2nd. Because the Council is entering upon original work in an entirely new field and we feel the need of the coöperation of all members of the Massachusetts Dental Society.

About three years ago we attempted the solution of a problem which most of you realize resulted in the introduction of a Standard Lecture on Mouth Hygiene.

The conception of the scheme was prompted by the same old question of economics and efficiency which faces all practical workers in every branch of human activity.

The preparation of an illustrated lecture on "The Care and Use of the Human Mouth" that will not only present the facts which the public needs to know, but present them in attractive and interesting form, involves considerable expense.

Those who were behind the idea believed that this large outlay of time and money repeated over and over again by individuals was needless waste; that a Standard Lecture could be prepared which could be furnished with manuscript and lantern

¹ Read before the Massachusetts Dental Society, Springfield, Mass., May 3, 1917.

slides to any dentist or other properly qualified person who was desirous of presenting the matter to the public.

Most of you know the success of the venture. A lecture was issued which, to date, has been presented before more than half a million people.

For a nominal rental fee the prospective speaker may secure all that is needed for an interesting and instructive discourse except the speaking voice.

Many hours of time and many dollars have been saved for better uses than repeated reconstructions of one piece of work and a decided step was made in the direction of efficiency in connection with Mouth Hygiene Educational Work.

Important as has been the development of the Standard Lecture, however, the field we have recently entered presents a much greater need of reforms in connection with economy of production and increase of efficiency.

The Public Dental Clinic is a comparatively young institution. How many there may be in this country at the present time no one knows, as, unfortunately, no records exist to which we may refer, but from information gained through press clipping bureaus and other sources it seems safe to say that they are being established in the United States at the rate of nearly one a day.

These institutions, with very few exceptions, are being conceived, organized and managed by inexperienced men; dentists and others who are taking their first experimental steps in a new field.

It would probably be hard to find a representative of "big business" who would not condemn such a method as an unnecessary gamble against great odds.

The average dentist's opinion would be that the situation is unfortunate but unavoidable.

We have entered our present field in the faith that the situation is *not* entirely unavoidable.

The average dental clinic is organized by a small group (rarely more than ten per cent) of the dentists in a given com-

munity working in conjunction with a women's club or some other lay organization interested in social service.

They meet in joint conference and committees are appointed to study and arrange details. Finally, after much research, a more or less definite plan is adopted and they approach the school committee and board of health with an argument based on the personal opinions of a group of individuals who have hastily studied and attempted the solution of a problem they have never seriously considered before.

The "powers that be" after several weeks of deliberation accept the proposition reluctantly, possibly with a little financial aid, more probably with permission only for the establishment of the proposed institution in one of the public schools.

Some sort of an examination seems to be the proper thing and this is proceeded with, sometimes with no definite object in view.

The selection of equipment is next in order and this is found to be not the least of the difficulties, as the proper equipment for a dental clinic is quite unlike that of a private office, though this fact is seldom discovered until the work is well under way. After several weeks of tiresome effort on the part of the few willing workers, the clinic opens for business.

Perhaps not until then is it discovered that special rules of operative procedure should be adopted which are again unlike those which govern the practitioner in private practice.

Finally, however, we will suppose that, after many failures, many changes of plans, many months of hard labor and study the institution develops into an efficient stage delivering maximum production at minimum expense, with a system that runs like clock work.

It has taken at least six months to develop the idea to its present point of efficiency.

It would not take as many weeks for the same group of men to establish another clinic just like it, on the same efficient plane, with no development or experiment necessary.

This, in simple terms, expresses the basis of reasoning which has brought us to the conclusion that there is a very evident demand for the Standardized Dental Clinic.

The standardization of the dental clinic simply means the adoption of definite or standard rules of organization, equipment, operative procedure and general management; said rules to be formulated, not from the narrow view points of a small group of men but after careful study of all available data, investigation and research covering all the factors of influence in connection with successful and unsuccessful institutions.

• It is not the purpose or intention of the Dental Hygiene Council of Massachusetts to attempt the full solution of this important problem.

Our present efforts are directed toward the accomplishment of two objects.

First, By the compilation of such data as is available, investigation of clinics in operation and conferences with those who have been active in their organization and management, we hope to be able to offer a practical scheme covering most of the details of organization, equipment, operative procedure and management to any body of individuals soliciting our assistance in the establishment of a clinic.

Second, We hope to be able to prove by such practical demonstration, as well as theoretical argument the value of clinic standardization that other organizations and possibly endowed institutions may be induced to extend the work we have started to the point where the desired standard may be established.

The work we are at present undertaking may be grouped under five heads.

We are aiming toward the establishment of more or less definite standards in connection with the following items:

1st. EXAMINATIONS.

The preliminary examination of school children's teeth is not always necessary.

If the local authorities are thoroughly appreciative of the amount of oral disease needing attention, funds are easily obtained and the public does not need any special appeal to assure its support; an examination is not called for.

If, on the contrary, the authorities or others in any community need a convincing argument, there is nothing more strik-

ing than the figures which show that 95 to 97% of *their own* children are afflicted with diseased mouths.

Figures from other towns affect them but little. Few of them believe that such conditions as are quoted from elsewhere are present in their own community.

When an examination is needed it should be so conducted and tabulated as to accomplish its purpose. It is not our present belief that this means the thorough examination, with marking of cavity locations resorted to in private practice.

A simple record of the probable number of fillings, pulp treatments and extractions needed seems to cover the requirements.

2nd. EQUIPMENT.

The selection of equipment to fulfill the special purposes of clinic work is not a simple matter, there being added difficulties at present due to the condition of the instrument market.

The elaborate equipment of the average private office is not practicable nor even possible in the public clinic, and standardization of equipment seems to be a matter of considerable importance.

It is obvious that all operators could not be suited with any selection of reasonable size. There is but one way to meet the situation and that is to determine upon an equipment which it is reasonable to ask operators to adapt themselves to.

With this end in view we are preparing lists to meet varied appropriations from five hundred dollars upward.

3rd. RECORD AND CLERICAL SYSTEM.

A simple but comprehensive record and clerical system is necessary and the adoption of a standard method is of very great importance.

First, Because it is possible to produce standard cards and other printed forms in large quantities which may be sold in small lots at reduced rates.

Second, Because the use of standard forms in all clinics would facilitate the easy compilation of statistics of immense value in extension work.

We have, so far, determined upon an Operating Record Card, with Key or Symbol Card, an Appointment Card, an Ap-

plication and Registration Card, and an Operator's Monthly Report Form, copies of which are submitted herewith.

A blank space is left on each form for the name of the clinic which may be inserted with rubber stamp.

We have arranged with a Boston printing house to keep these cards and other forms in stock and furnish them in small lots at reasonable prices; very much less than the cost of having similar matter printed on special order.

4th. RULES OF OPERATIVE PROCEDURE.

The formulation of some special rules of operative procedure for clinics seems to be needed, not only for the purpose of holding the operator to certain routine, but also to relieve him of responsibility.

Operators as a rule welcome such a plan because it gives them something to fall back on when a question of proper method arises.

These rules are not inflexible and we will very probably issue them as the Council's "Rulings" rather than "Rules," as they are intended mainly to furnish the operator with an authoritative backing on some methods of operative work where the need would likely arise.

As an illustration, we may adopt the ruling that in public clinics all permanent molars in the mouths of children below a certain age where there is pulp involvement should be extracted.

This would not mean that an operator would not be at liberty to treat such a tooth if the case seemed to warrant it, but if he chose to extract, as we advise, he has our backing.

5th. REGISTRATION OF OPERATORS AND ASSISTANTS.

Salaried operators and assistants are found to-day in the majority of successful clinics, and although much of our public work in many places must be started by volunteers from the profession, it is generally considered that the appointment of one or more paid operators and assistants is an important step in the direction of assuring the clinic's permanency.

The operators must be selected carefully, with due consideration of those special qualifications which fit them for the work.

They should have serious appreciation of their responsibili-

ties as their duties do not stop with the filling, extraction and polishing of teeth.

No educational work is more effective than that of the conscientious operator at the chair. The patient is in a mood to receive education. The results of neglect are demonstrated practically to him, and he may be easily impressed with the value of a clean mouth and taught how to keep it so.

Applicants for clinic appointments who are equal to these responsibilities are not plentiful, but we hope to find a way by examination and otherwise to find a sufficient number of men we can recommend to supply such demands as come to us.

This, in general, covers the work we are at present attempting in connection with the Standardization of the Dental Clinic.

The main purpose in giving this report prominence at this meeting is to secure the coöperation of such members of the Society as are interested in clinic work, which, in these days, excludes but few.

We are attempting the compilation of a series of reports from all clinics operating in the state, covering many important details of organization and management. Special report blanks have been prepared for the purpose and copies will be forwarded to anyone representing a clinic who will help us in the work.

We are also ready and willing to confer with any committees or individuals who are contemplating the organization of a clinic with a view to extending to them such aid as we are at present able to offer in the drafting of a systematic and practical plan.

The practical results of the Council's present work depend entirely upon coöperation.

The properly standardized clinic must be the outcome of many individual opinions and experiences, the most valuable of which must be selected by a sifting out process in a central clearing house.

At present this is the part the Council will attempt to play and we ask you to help us in our efforts to make the public dental clinic a more efficient institution.

Respectfully submitted,

EDWIN N. KENT, D.M.D.

President.

STUDIES OF DENTIFRICES¹

BY WILLIAM J. GIES AND COLLABORATORS

(From the Biochemical Laboratory of the Schools of Medicine and
Dentistry of Columbia University, at the College of Physicians
and Surgeons, New York.)

1. Does "Pepsodent," used as a dentifrice, appreciably digest or dissolve dental mucin plaques, or prevent their formation on the teeth, through the action of pepsin?²

BY ELIZABETH C. FRANKE.

I. Introduction

"Pepsodent" is a dentifrice now advertised as a "proteolytic tooth paste" that will "end the plaque" by digesting it, and which will "enable the patient to keep the teeth and mouth surgically clean," thus "doing what was heretofore impossible." This dentifrice, "made under the patents of Wm. M. Ruthrauff, A.B., A.M.," is marketed by "The Pepsodent Company, Ludington Building, Chicago."

The most important claims currently set forth by the Pepsodent Company, in its pamphlet enclosed with each tube of this preparation, and entitled, "That film on the teeth: the source of *all* tooth troubles; how you may *forever* end it," and in various advertisements in dental and lay journals, are indicated in the appended summary (*italics ours*):

I. Pepsodent is reputed to be able to "digest," "dissolve,"

¹ We aim, in these studies, to test the prophylactic, or therapeutic, claims made for dentifrices by their manufacturers. We proposed this line of research, four years ago, in the following memorandum (JOURNAL OF THE ALLIED DENTAL SOCIETIES, 1914, ix, p. 327) under the head of "suggestions of main lines for early investigation": "Determine the chemical and physiological properties of the leading dentifrices on the market, with the avowed intention of publishing, *as a matter of public service* and in a strictly judicial temper, the merits or lack of merits of each preparation examined."

² This paper describes tests conducted under the auspices of the First District Dental Society of the State of New York, and comprises the first portion of the senior author's annual report to the Society for the academic year 1916-17. Preliminary notes regarding this research were published, in the form of a letter, from the senior author "to the editor" (dated March 24, 1917), in the *Journal of the American Medical Association*, 1917, lxviii, p. 1278; *Dental Outlook*, 1917, iv, p. 150.

and "prevent the formation of," the "film on the teeth that is the source of all tooth troubles."

"The object of Pepsodent is to apply to the teeth an efficient mucin digestant." . . . The *whole* object of Pepsodent is to *dissolve* the film (albuminous plaque, mucin plaque, bacterial plaque); to keep it from forming and to remove it." (Quotation from a full page advertisement in the *Journal of the National Dental Association*, March, 1917; also in *Dental Cosmos*, March, 1917.)

"Pepsodent *digests* bacterial plaques: a new principle in mouth hygiene. The proteolytic tooth paste—dental mucin digestant." (Quotation from a full page advertisement in the *International Journal of Orthodontia*, January, 1917, also in *Dental Items of Interest*, January, 1917.)

"Pepsodent *prevents the formation of film*." (Quotation from a full page advertisement in the JOURNAL OF THE ALLIED DENTAL SOCIETIES, March, 1917.)

"The *object* of Pepsodent is to daily *digest* that film in every edge and crevice. Digestion will *dissolve* it . . . (Pepsodent) is the only harmless film digestant available for home use." (Quotation from a full page advertisement in the *Outlook*, April 4, 1917.)

2. The agent in Pepsodent that is said to be its "*efficient mucin digestant*" is pepsin.

"Pepsodent attacks this (mucin) plaque with pepsin, the digestant of albumin." (*Journal of the National Dental Association and Dental Cosmos*, *loc. cit.*, I, above.)

"That film is albuminous. Pepsodent is *based on* pepsin, the digestant of albumin." (*Outlook*, *loc. cit.*, I, above.)

"Why the tooth brush fails You do not end the film You must *first digest it*. Pepsin is *the digestant of albumin*. . . . A way has been found to activate pepsin without any harm to the teeth. This activated pepsin is the *basis* of Pepsodent. And its constant right use will insure any person *perpetual freedom* from film." (Quotation from a two-thirds page advertisement in the *Literary Digest*, July 28, 1917.)

"That film is 'albuminous.' . . . The fact that it is albuminous makes pepsin the *logical agent* (to 'end the film'). Pepsin is the best solvent of albumin known. It is Nature's perfect digestant of albuminous foods."³ (Quotation from the *Pepsodent pamphlet*, "That film on the

³The assertion that pepsin is the "best solvent of albumin known" is not in accord with elementary facts of biological chemistry. The remark that pepsin is "Nature's perfect digestant of albuminous foods" is true if "perfect" is intended to mean preliminary, incomplete or imperfect, and if "digestant" is intended to mean agent that begins but does not complete the digestion of albuminous foods. We wonder why Ruthrauff believes that pepsin is a more "logical" agent in this connection than such an enzyme as trypsin or bromelain. (See page 377.)

teeth: the source of all tooth troubles; how you may forever end it," 1917, pp. 3 and 5.)

3. It is well known that pepsin is powerless ("inactive") as a digestive agent in the absence of hydrogen ions, that is to say, pepsin is more or less active in acid media,⁴ but is inactive in all neutral or alkaline media.

It is claimed that Pepsodent contains *acid* calcium phosphate, and that this *acid salt* supplies hydrogen ions ("activates") in proportions sufficient to make the associated pepsin an "*efficient* digestant of dental mucin film," when Pepsodent is used as a *dentifrice*.

"Its uniqueness (Pepsodent) lies in combining with pepsin a harmless activating agent—acid calcium phosphate." (*Journal of the National Dental Association*, and *Dental Cosmos*, *loc. cit.*, I, above.)

"In Pepsodent we use an activating agent which cannot harm the teeth." (*Outlook*, *loc. cit.*, I, above.)

"Pepsin requires the aid of *an acid* to make it active as a digestant" The writer (Ruthrauff) had the good fortune to discover that calcium phosphate, *the mineral food which forms the teeth and bones*, would neutralize the hydrochloric acid *in the stomach*, without reducing the power of the pepsin to digest albumin. He found that when calcium phosphate neutralized hydrochloric acid, *an acid salt* was formed which had *the same power to activate the pepsin*⁵. The fact that this salt is afterwards taken up by the blood and that from it the teeth and bones are formed, convinced him that he had, in acid calcium phosphate, a pepsin activator harmless to the teeth." (*Pepsodent pamphlet*, *loc. cit.*, 2, above, p. 5.)

"The unusual results obtainable from the use of Pepsodent are due to the *physiological action* of pepsin-acid-calcium phosphate upon the 'albuminous proteid' or mucin films which, because they are insoluble in saliva, accumulate upon the teeth." (Quotation from the statement des-

⁴ In some acid solutions pepsin is powerless despite the presence of hydrogen ions.

⁵ Note the significance of this statement in the light of our criticism on page 375.

⁶ We found in this laboratory, eight years ago (Lothrop: *American Journal of Physiology*; 1909, xxiv, p. 320), that when tri-calcium phosphate (bone ash) is added to a hydrochloric acid solution of pepsin, the proportion of free acid is reduced by the consequent production of "an acid salt" and that the latter has very much less, may even have no, power to "activate" the pepsin—just the reverse of what Ruthrauff claims he "had the good fortune to discover." Ruthrauff's so-called discovery contradicts, besides, the accumulation of hundreds of direct chemical observations in this connection by numerous investigators, during a period of many years. The results in this relation, in the present paper, likewise controvert Ruthrauff's "discovery."

ignated "important" on the boxes that enclose the tubes of Pepsodent as it is sold by the Pepsodent Company.)

4. The inventor and producers of Pepsodent claim that Pepsodent stimulates the flow of saliva.

"*Pepsodent produces a copious flow of saliva.* Retain this until through brushing by holding the head well back. Then force the paste, dissolved in (*the copiously produced*) saliva, vigorously back and forth between the teeth. This stimulates the gums, removes food particles and gives Pepsodent a chance to reach all tooth surfaces." (*Pepsodent pamphlet, loc. cit., 2, above, p. 16.*)

5. It is claimed that Pepsodent contains tri-calcium phosphate, an "efficient polishing agent."

"With the activated pepsin we combine an abrasive of calcium phosphate, the chief tooth component."⁷ (*Journal of the National Dental Association, and Dental Cosmos, loc. cit., 1, above.*)

"Pepsodent removes these films by combining the digestive action of pepsin with an efficient polishing agent." (*International Journal of Orthodontia and Dental Items of Interest, loc. cit., 1, above.*)

"The object of Pepsodent is to daily digest that film in every edge and crevice. Digestion will dissolve it. Then the gentle abrasive in Pepsodent easily removes it."⁸ (*Outlook, loc. cit., 1, above.*)

"Nature herself has pointed the way to clean the teeth: pepsin, Nature's albumin digestant to dissolve the film; acid calcium phosphate to activate the pepsin; and calcium phosphate to polish the teeth and mechanically aid in removing the film."⁹ (*Pepsodent pamphlet, loc. cit., 2, above, p. 6.*)

6. It is claimed that "Pepsodent is the only agent that will enable the patient to keep the teeth and mouth surgically clean." (*International Journal of Orthodontia and Dental Items of Interest, loc. cit., 1, above.*)

The justification for a claim as remarkable as this has not been stated anywhere, so far as we have been able to learn.

⁷ Compare this claim with the one referred to in section 1, where it is said the "whole object of Pepsodent is to dissolve the film" by digesting it with pepsin. See page 377. If the "whole object is to dissolve the film" already formed, how can it be urged that Pepsodent is intended to prevent formation of the film? If the digestive action of the pepsin in Pepsodent prevents the formation of mucin plaques, why is an abrasive included among the ingredients of Pepsodent for the removal of what the pepsin in Pepsodent prevents from forming?

⁸ How could an abrasive remove digested and dissolved film?

⁹ The abrasive in this case appears to have two uses: to polish and to remove.

7. "Pepsodent not only removes the film, in which germs breed, but it gives the gums and other tissues of the mouth greater power to resist these germs. And, in diseased conditions, aids materially in Nature's method of reconstruction and repair." (*Pepsodent pamphlet, loc. cit., 2, above, p. 7.*)

The facts that justify this claim do not appear to have been published.

II. Experimental

Our tests of the validity of the *most important claims* for Pepsodent were made on products purchased in the open market—occasionally, as needed, at six different stores in New York City. The results of our inquiry are indicated briefly in the appended summaries (A-E).

A. Pepsodent contains pepsin or something that, under particularly favorable *laboratory* conditions, behaves very feebly like pepsin (*I-2, above*).

(a). The proportion of contained pepsin is so small, however, or its activity is so slight, that, even in its most concentrated form, Pepsodent showed no material proteolytic power in typical digestion-tests lasting much longer than the maximum period of time involved in the prolonged *practical* application of a dentifrice to the teeth.

(b). The digestive power of Pepsodent is so slight and insignificant that little or no digestion of salivary mucin, or of fibrin, occurs in Pepsodent, or in "dilutions" of it, under the most favorable laboratory conditions, within a period of several hours; gradually, thereafter, on standing in an incubator, a very slight degree of proteolysis slowly becomes perceptible. The digestive power of Pepsodent is so weak that only the most careful effort to discover it, under conditions that are not paralleled in the mouth, enables one to discern it.

(c). The slight degree of peptic digestive power that Pepsodent is slowly able to exercise, under the very favorable laboratory conditions just stated (b), is completely suspended by the addition of such proportions of saliva as would ordinarily be mixed, in the mouth, with the quantities of Pepsodent used to clean the teeth.

Methods (a, b, c). Our digestive tests in these relations were made

with very small amounts of salivary mucin or blood fibrin. Pepsodent was used directly, and in numerous grades of "dilution" in from 1 to 256 weights of water or saliva. In many experiments Pepsodent mixed with water (1:1 or 1:2) was centrifuged and the clear centrifugates used, direct or diluted, for tests of digestive power. The experiments were conducted in an incubator at body-temperature. The most elaborate tests were continued, as a rule, for from 12 to 24 hours, with repeated examinations for digestive results—in these cases for swelling, disintegration, and diminution in the amount, of the delicate fibrin shreds, or of the mucin flakes or particles, or of the masses of both kinds of proteins.

Results similar in negativity to those reported above (*a—c*) were obtained in this laboratory eight years ago, and described as follows:

"The effect of bone ash on specially *dilute* pepsin solution was determined under the following conditions:

"20 c.c. of 0.2 per cent. HCl containing 0.01 per cent. of pepsin (Merck, 'Ph. G. IV'); fibrin, 0.1 gram; temperature, 40° C. The experiment was started at 9 P. M. Amounts of bone ash used:

"Test no.	1	2	3	4
"Bone ash (mg.).....	0	50	100	200

"After three hours, digestion was evident in tests 1 and 2; it was practically complete in tests 1 and 2 *at nine o'clock on the following morning*. In each of tests 3 and 4 there was an appreciable residue (of undigested fibrin), *even at the end of twenty-four hours*, but after standing for *several days*, digestion in tests 3 and 4 was also practically complete, although free acid was absent from test 4."¹⁰

(*d*). According to Ruthrauff (Pepsodent pamphlet, *loc. cit.*, 2, above, p. 8), "that film (mucin plaque, albuminous plaque, bacterial plaque) will even *grow* upon glass slides in the laboratory, if they are kept in saliva at mouth temperature."

We have tested the digestive power of Pepsodent on such "films," obtained by the method described by Ruthrauff, on glass slides immersed in saliva; and on such films on the sides of the cylinders containing the glass slides and saliva. We find that Pepsodent exerts practically no more disintegrative or solvent effects on such films than does saliva or water, even after continuous contact of Pepsodent with such films at body temperature for several hours.

The portions of such films that are immediately adherent to the glass successfully resist the action of Pepsodent—that is, do

¹⁰ Lothrop: *American Journal of Physiology*, 1909, xxiv, p. 320.

not completely dissolve—in typical digestive tests lasting 24 hours, though such films can be readily removed, at the beginning as at the end of the tests, by a few light strokes with a test-tube brush or a tooth-brush. The portions of dental plaques that adhere most closely to teeth are plainly the most influential in causing and advancing dental caries.

The claim that Pepsodent, *used as a dentifrice, dissolves and removes* dental mucin plaques, could not be more strikingly denied experimentally than by the failure of Pepsodent to disintegrate and wholly to detach the salivary films, on glass slides, prepared by the method described by Ruthrauff.

(Ruthrauff has not shown that any of his artificial salivary films contain any of the bacteria that cause dental caries.)

Methods (d). For these particular tests many specimens of "that film" were prepared by placing glass slides in an upright position in narrow cylinders "containing about one inch of saliva," as recommended by Ruthrauff, and incubating in each case for from 12 to 16 hours. "The film growth began (as Ruthrauff states) at the surface of the saliva, *where exposed to the air*. Then it grew thicker and spread over a large surface of glass." Such "films" were always deposited at and above the surface of the saliva, and were plainly *desiccation layers* sedimented by evaporation of the water from capillary suspensions from the saliva.¹¹

¹¹ Microscopic examination showed clearly that such "films" were primarily stratified desiccation deposits. They began to be conspicuous within an hour after incubation had been started—long before bacterial development could become gross enough to be visible to the naked eye. The formation of these films was confined to the capillary zone above (and beginning at) the surface of the saliva. There was practically no film-formation at all on slides in cylinders that were tightly stoppered to prevent desiccation of the capillary salivary films. Such films developed during the incubation period (12-16 hours) quite as abundantly on slides in saliva that had been *boiled* as they did in saliva in which the bacteria had not been killed by boiling—just as mere desiccation films would be expected to develop by Ruthrauff's procedure.

That the "plaques" obtained by Ruthrauff's method are merely *desiccation deposits* with imbedded bacteria, and not bacterial "growths," is shown with further special conclusiveness when, prior to its incubation, the saliva, free from froth, is covered with a thin layer of indifferent, non-volatile, liquid, such as neutral olive oil. Under such conditions there is no evaporation on the sides of the cylinder or on the glass slide in it, and there is no "plaque" formation, although there is an increased growth of non-adherent bacteria in the liquid under the oil.

Such films also "grew," to use Ruthrauff's word, quite as markedly in saliva treated with equal volumes of such germicides as carbolic acid (1.0 per cent), alcohol (20 per cent), and hydrochloric acid (5 per cent), as they did in untreated saliva. The greatest extent of film development was obtained, in these particular tests, in the saliva-alcohol mixtures, evidently because of the latter's greatest degree of capillarity and vaporizability. Such films formed readily in saliva-Pepsodent mixtures (1:1), contrary to Ruthrauff's claims that they do not; they formed more abundantly in such saliva-Pepsodent mixtures than they did in saliva thickened with gum arabic, mainly, it seems, because evaporation of water from the latter was much slower. In the thick saliva-gum arabic mixtures, film-formation was slow and slight.

Such desiccation "plaques" obviously contain water-soluble substances, albumin and some forms of mucinate among them. Any diminution in the

These desiccation "films," consisting of deposited salivary solids and containing imbedded bacteria, were gently washed with water, or saliva, to dissolve *water-soluble* matter. Practically all the soluble portion of the "films" was thus removed, as microscopic examination showed—material that Pepsodent is able to dissolve through the agency of the *water* it contains! The resultant film-residues were then treated, *in situ*, with a small amount of Pepsodent (direct, or "diluted," 1:2, with water), or with centrifugates from similar aqueous "dilutions"; and each mixture protected by a glass cover-slip, was kept at body-temperature on a water-bath. The slides, in a given series of tests on a bath, were kept covered with a large watchglass to retard evaporation of the liquids under the cover-slips. Evaporated water was replaced from time to time, as the rate of unprevented desiccation made necessary. At the conclusion of a test, the cover-slips were lifted cautiously to *prevent removal of film-residue by capillarity or abrasion*; the Pepsodent mixtures were gently flushed away from the film-residues; and the latter were compared, macroscopically and microscopically, with "control" films treated, simultaneously and similarly, with water, 1 per cent acid calcium phosphate solution, 0.2% hydrochloric acid solution, or 0.2% hydrochloric acid solution containing 0.2% of pepsin.

The "films" on the sides of the cylinders (in which the glass-slides had been placed for the production on them of films by Ruthrauff's method) which, as in the case of the "films" on the slides, were deposited at and above the surface of the saliva, were subjected to similar treatment, in an incubator, with large volumes of Pepsodent or of the Pepsodent "dilutions" and the other media referred to in the preceding paragraph.¹²

amount of such a film, after its immersion in water or Pepsodent mixtures, must be due, in large degree, obviously, to simple solution of such water-soluble substances contained in the plaques.

After gently washing all these types of films with water, and staining them with methylene blue, according to the procedure used by Ruthrauff in obtaining the "laboratory proof" that is illustrated in his pamphlet (see footnote 12), we found that each film-residue became blue except that from the film produced in the saliva-gum arabic mixture, which film was evidently completely dissolved by the water. The amount of stainable film-residue from the film produced in the saliva-Pepsodent mixture was small, but it was more than that in the film-residue from the film produced in the saliva-gum arabic mixture (where there was none) and less than that from such media as the saliva-carbolic acid mixture and the boiled saliva—facts strongly emphasizing the truth in our conclusion that Ruthrauff's artificial mucin plaques are merely salivary *desiccation deposits* and not "growths" analogous to plaques on teeth.

¹²In his pamphlet accompanying each tube of Pepsodent (*loc. cit.*, 2, above), as this dentifrice appears on the market, Ruthrauff described the method of producing "that film" on glass slides, referred to above, in an introduction to his "laboratory proof" that Pepsodent "*prevents* film growth." He added Pepsodent to saliva (proportions not stated) in tubes containing upright glass slides and found that, *after standing 12 hours*, "there was no film growth," whereas in saliva without Pepsodent there was "film growth." This finding was presented, in the pamphlet, with numerous illustrations and deductions, so stated as to indicate that the outcome was significant or important. We stated, in footnote 11, that we ourselves have observed "film growth" in saliva-Pepsodent mixtures (1:1). Ruthrauff does not recommend that Pepsodent should be held in the mouth for 12 hours in order to "prevent film growth" on the teeth. Why, then, should the results of a test of this inappropriate character, in test-tubes, be presumed to indicate *anything*, in fact or in principle, about the "pre-

(e). Pepsodent is so poorly adapted to effect *peptic digestion* to a *practical* degree that, even after the addition of large proportions of 0.2% hydrochloric acid solution to Pepsodent, direct or "diluted," the mixtures remain practically inert digestively.

Methods (e). Various "dilutions" of Pepsodent (1:1 to 1:32) were kept at body-temperature for 1 hour and 30 minutes, with very small shreds of fibrin or tiny particles of mucin as the protein substrate. There was no perceptible digestion in any mixture. To each liquid was then added an equal volume of 0.2% hydrochloric acid solution, and the fluids mixed and incubated further for 1 hour and 30 minutes. Again there was no sign of digestion. The protein masses also failed, in every instance, to become bloated whereas, in a water control, after the addition of the acid, each showed the typical swelling that *precedes* peptic digestion of fibrin or mucin in dilute solutions of hydrochloric acid.

(f) Pepsodent is not only a very weak and *inefficient* proteolytic agent but, when added to digestively active solutions of pepsin-hydrochloric acid, Pepsodent may completely suspend the peptolytic power of such solutions.

Methods (f). Peptolytically active solutions of 0.2% hydrochloric acid (5 c.c.), containing 0.2% of pepsin, were treated with 1/5 to 4/5 of their volumes of uniform Pepsodent-water mixtures (1:1) and the total volumes of the fluids equalized (10 c.c.) with water. Delicate shreds of fibrin were used as the protein substrates. The mixtures were incubated at body-temperature. There was practically no digestion in any mixture at the end of 6 hours of such treatment.¹³

B. Pepsodent is *acid* in reaction (3, above).

(g). The acidity of Pepsodent is said, by Ruthrauff, to be due *wholly* to acid calcium phosphate. Such acid phosphate is

ventive "influence of Pepsodent used as a dentifrice. (See the discussion on 375.) It is difficult to understand why Ruthrauff did not ascertain, and *show*, the action of Pepsodent on *films prepared and treated by suitable methods*, rather than test and discuss the possibility of preventing the formation of "that film" under artificial conditions that are not, and never could be, duplicated, or even paralleled, under practical conditions, in any mouth or on any teeth. This is Ruthrauff's advertised "evidence" that Pepsodent, *used as a dentifrice, prevents* the formation of "that film." Ruthrauff particularly fails to show how the feebly active pepsin in Pepsodent, present in the mouth only a minute or two before the accompanying activator (*acid* calcium phosphate) is neutralized by the saliva, *can* continue to prevent formation of plaque during the interval before the succeeding application of the dentifrice.

¹³ It has long been current biochemical knowledge that acid phosphates markedly impair the digestive action of pepsin-hydrochloric acid solution, and that they also interfere with the bloating action of hydrochloric acid on particles of such proteins as fibrin and mucin. Ruthrauff's "discovery" to the contrary has not been verified. (See page 365.)

present in Pepsodent. The aqueous distillate from a Pepsodent-water mixture is slightly acid in reaction, indicating the presence in Pepsodent of volatil "acid," free or combined—presumably added to Pepsodent with volatil oil used as a flavoring constituent (peppermint). The Pepsodent-residue, remaining after distillation, is less acid than the original paste. These facts indicate that Pepsodent contains *some* volatil "free" acid, or material that is readily convertible into "free" acid.

The *direct* tests for "free" acid in Pepsodent were negative, but the delicacy of the reagents conveniently available for this purpose is materially impaired by some of the Pepsodent constituents, and these particular negative results therefore lack significance.

Filtrates from alcoholic precipitates in Pepsodent-water mixtures, after removal of the alcohol, gave positive responses for *free* acid to tests with Töpfer and Günzberg reagents.

The presence, in Pepsodent, of an abundance of tri-calcium phosphate (see D, below) suggests that "free" acid is absent from Pepsodent. It is possible, however, that one or more of the associated constituents of the paste (*e.g.*, gum) prevent the basic phosphate from reacting with, and wholly neutralizing, any small quantity of "free" acid originally present in the Pepsodent mixture. Reaction between desiccated tri-calcium phosphate and small proportions of various acids is very slow and incomplete.¹⁴

Methods (g). The reaction of Pepsodent and of centrifugates, dialysates, distillates, and distillation-residues, from Pepsodent-water mixtures, was tested, on glazed porcelain, with solutions of litmus, lacmoid, phenolphthalein, congo red, para-nitrophenol, methyl orange, and cochineal, and with test-papers of litmus, lacmoid, and congo red; also with Töpfer and Günzberg reagents. The reaction of each mixture was slightly acid to all the indicators except the last two. (See *h*, below.) (Further tests of reaction, both qualitative and quantitative, will be made in a special

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study of this phase of the subject. Thus far we have studied the acidity of Pepsodent primarily from the standpoint of its utility as a pepsin activator. See page 378.)

In the preparation of the distillates, the Pepsodent-water mixtures were heated on a water-bath. Dialysates were obtained with collodion bags. Alcoholic precipitates were made in Pepsodent-water mixtures with acid-free alcohol. The alcoholic filtrates, and alcohol-water control volumes, were evaporated nearly to dryness at a low temperature on a water-bath. Response in the tests for free acid was positive in the filtrates and negative for the controls.

(h). The *prevailing* acidity of Pepsodent is comparatively slight in degree; it is very much less than that of gastric juice and does not appear to be sufficient, in kind or proportion, effectively to activate pepsin.

Methods (h). The limit of sensitiveness of an available supply of lacmoid paper to hydrochloric acid was 0.00025% of the latter in aqueous solution. The limit of sensitiveness of this lacmoid paper to the acidity of Pepsodent was attained at a "dilution" of 1 part of Pepsodent in 95 parts of water—acidity theoretically though not actually equal in the Pepsodent to that of 0.025% hydrochloric acid solution.

The titratable acidity of centrifugates from Pepsodent-water mixtures (1:2) was about 1/5 that of a 1% solution of commercial acid calcium phosphate— $\text{Ca}(\text{H}_2\text{PO}_4)_2$.

In the tests referred to in section (g), the responses for acidity were always relatively weak—never equal in degree to that of 0.02% hydrochloric acid solution, for example.

(i). The acidity of Pepsodent does not appear to be sufficient, in kind or proportion, to involve damage to dental enamel from the use of Pepsodent as a dentifrice.

There appeared to be a whitening effect, on natural extracted teeth, after their immersion in Pepsodent for several hours, although the smoothness of the enamel was unaffected. We attribute the whitening effect to abstraction of water by osmotic influence. This matter will receive further attention in a special study of it. (See page 378).

Methods (i). Sound teeth were immersed in Pepsodent, also in centrifugates from Pepsodent-water mixtures (1:2). Immersion, for periods that were much longer than any involved in the use of a dentifrice, was without effect on the condition of the enamel. Such treatment in Pepsodent for one hour, for example, failed to affect the luster on the enamel of natural extracted teeth. The enamel became whiter after immersion

of the teeth for several hours, as if water had been abstracted or "smooth white decalcification" had occurred.

(j). The acidity of Pepsodent is sufficient, in kind and degree, to precipitate mucin from neutral or alkaline solutions of mucinate and from mucinous films. On this account, Pepsodent is able to disorganize dental mucin plaques and to facilitate their removal.

Methods (j). A few drops of clear, neutral or alkaline, solution of sodium mucinate were treated, on a glass slide, with centrifugate from Pepsodent-water mixtures (1:2). The mucin was promptly precipitated, just as it was by a solution of acid calcium phosphate of equal acidity. Such centrifugates, mixed with thick saliva, yielded analogous precipitates. Desiccation films made by Ruthrauff's procedure (p. 366), from particularly viscid saliva, yielded similar evidence of mucin precipitation under the same conditions of treatment.

C. Pepsodent effectively stimulates the flow of saliva when this paste is used as a dentifrice (4, above).

(k). The saliva that flows in response to stimulation by Pepsodent is more abundant than that secreted ordinarily, immediately prior to such stimulation, and is also *more alkaline than the latter*.

Methods (k). A measured volume of water (5 c.c.) was held in the mouth for 30 seconds. All the oral mixture then available was allowed quickly to run through a small funnel into a graduated cylinder and the volume of the recovered liquid noted. Prompt repetitions gave the volumes of "pre-control" diluted salivary liquids recovered *prior* to stimulation with Pepsodent. These volumes represented normal unstimulated secretion, with gains and losses included, as a uniform basis for determinations of effects of stimulation (including "after-flow"). A small amount of Pepsodent, on the tip of a glass rod, was then placed on the tongue; 5 c.c. of water were taken into the mouth immediately; and the rapid mixture thus produced was held, as before, for 30 seconds. Salivary response could be *felt*. The oral liquid was then collected and measured, as in the case of the "pre-control" recoveries. Prompt repetitions gave the recorded responsive productions of salivary liquid immediately *after* stimulation with Pepsodent. "Post-control" volumes, without such stimulation, were then obtained as in the case of the "pre-control" volumes. All the collections were made in a continuous series as rapidly as possible. The amount of Pepsodent used in each case was *purposely* kept small to determine degree of stimulative response under conditions that were not particularly favorable to its elicitation, and also to reduce, to a negligible degree, *direct* contrary effects on salivary reaction. Effects on salivary

flow would have been greater, of course, with the larger quantities that are ordinarily used to clean the teeth. The alkalinity of the recovered salivary mixtures was determined by titration with $n/200$ hydrochloric acid solution, with methyl orange as the indicator.

The volumes and degrees of alkalinity of the "pre-control" mixtures were always less than those of the liquids obtained immediately after stimulation with Pepsodent, and during the "post-control" periods. The volumes and degrees of alkalinity of the latter, due to salivary "after-flow," were greater than those of the "pre-control" fluids, but less than those of the liquids recovered immediately after direct stimulation with Pepsodent.

D. Pepsodent contains an abundance of insoluble tri-calcium phosphate (5, above).

(1). From the statements in the Pepsodent Company's advertisements, it is inferred that the Company claims that tri-calcium phosphate is the *only* insoluble *abrasive* in Pepsodent. If such is the case, this phosphate occurs in Pepsodent in at least two distinct physical forms, which, under the microscope, appear as opaque amorphous masses, and as spherical bodies, or partly crystalline, translucent fragments. Many of the particles bear striking resemblance to those in bone ash, and *suggest* that the latter material is the source of some, if not all, of the tri-calcium phosphate in the samples of Pepsodent examined by us. The relatively large particles are the "gritty" matter in Pepsodent. Many of these particles are not only much larger than those of common precipitated tri-calcium phosphate, but are also much more resistant to the action of acids, such as acetic and hydrochloric, than are those in precipitated tri-calcium phosphate. The sharp edges on some of the translucent fragments strongly suggest the presence of pulverized crystalline phosphate.¹⁵

Methods (1). Pepsodent was mixed with a fairly large volume of

¹⁵ In a 1915 edition of the Pepsodent pamphlet, entitled "The prevention of dental decay and pyorrhea" (p. 5), it is stated that "the only abrasive, or scouring material, used in Pepsodent is an *amorphous* PRECIPITATED tri-calcium phosphate, which is the same chemical composition as the enamel, and, *therefore*, not hard enough to injure or abrade the tooth surfaces." (Ruthrauff evidently supposes that, for the same reason, "*therefore*" diamond cannot scratch graphite and diamonds cannot cut diamonds.) Nothing is said on this phase of the subject, in the copies of the Pepsodent pamphlet (*loc. cit.*, 2 above) that accompanied the tubes of the paste purchased by us, presumably of more recent preparation, except the remark (5 above) that "Nature herself has pointed the way to clean the teeth . . . and (to use) calcium phosphate (presumably tri-calcium) to polish the teeth and *mechanically* aid in removing the film." This omission from later editions of the pamphlet suggests that the *precipitated* product is no longer used in Pepsodent.

water. Much of the material remained undissolved. The bulk of the insoluble matter rapidly sedimented, by centrifugation or gravitation, under an opalescent or turbid acid solution.¹⁶ The sediment was washed rapidly and repeatedly with water, by decantation, until the washings were practically free from soluble phosphate. Under the microscope the abundant sediment was seen to consist mainly of the largest particles of the two kinds of material referred to above.

When treated with moderate excesses of dilute solutions of acetic acid or hydrochloric acid, the sediment markedly resisted their solvent action. Under identical conditions, precipitated tri-calcium phosphate, moist or dry (desiccated in air, or with alcohol and ether) dissolved almost immediately. Each of these acid solutions contained calcium and phosphate.

(*m*). The sediment obtained from Pepsodent by the method described above (*l*) is "gritty" enough to scratch glass.

Methods (m). Some of the sediment obtained by the method described above (*l*), when rubbed with a finger on a new glass-slide, immediately scratched the glass to a striking degree. Such sediment, when stirred with a horn spatula in a new beaker, promptly scratched the surface of the glass. Under the end of a stirring rod, such sediment "felt and sounded gritty"—just as Pepsodent does between the teeth.

(*n*). The "gritty" matter in Pepsodent does not seem to scratch teeth *when Pepsodent is applied to them with a tooth-brush*.

Methods (n). Vigorous brushing of natural extracted teeth, with Pepsodent on a tooth-brush, for 5-10 minutes at a time, failed to produce evidence of scratching. The surfaces of the teeth were examined before and after treatment, with a high-power lens.

In the light of the effects on glass, as indicated above (*m*), more elaborate tests in this connection are required, however, before we can be certain that the abrasive material in Pepsodent is entirely harmless, if applied to the teeth frequently. Such tests will be conducted in our further study of Pepsodent in comparison, on this point and others, with other dentifrices. (See page 378.)

E. Claims 6 and 7 above, which apparently are expressions of opinion and unsupported by any evidence we have been able to find, were not subjected by us to any experimental inquiry.

¹⁶ Among the substances in the solution were phosphate (some acidic), chlorid, calcium compounds (phosphate chiefly), protein, protease, alcohol (possibly some ester), glycerol, gum (arabic?) oil (peppermint), volatile acid.

III. Summary of the main results of the tests.

Our results (A-D, above) *support* the following advertised claims in behalf of Pepsodent (a'-f', below):

(a'). Pepsodent is an acid product, its acidity being due largely, if not entirely, to acid phosphate (B, above).

(b'). The degree of the acidity of Pepsodent is too slight to involve damage to dental enamel during any ordinary use of Pepsodent as a dentifrice (B, above).

(c'). Pepsodent contains protease that behaves very feebly like pepsin and appears to be pepsin (A, above).

(d'). Pepsodent, when used as a dentifrice, effectively stimulates the production of saliva (C, above).

(e'). Pepsodent contains an abrasive consisting largely, if not entirely, of tri-calcium phosphate (D, above).

(f'). The abrasive in Pepsodent appears to be devoid of harmful mechanical influence on dental enamel, in any ordinary use of Pepsodent as a dentifrice (D, above). We are not positive on this point, however.

Our results (A-D, above) *fail to support* the most important of the currently advertised claims in behalf of Pepsodent, in the following *fundamental* respects (g'-h', below):

(g'). The acidity of Pepsodent is either insufficient in proportion, or inadequate in kind, or both, effectively to "activate" the peptic enzyme contained in Pepsodent (B, above).

(h'). The peptic activity of Pepsodent is so slight and insignificant that Pepsodent cannot effectively digest or dissolve mucin (albuminous, bacterial) plaques from teeth, during any conceivable practical use of Pepsodent as a dentifrice (A, above).

IV. Discussion of results of the tests.

Our results question the validity of the most important advertised claim in behalf of Pepsodent—the *specific claim on which it is said the Pepsodent patent "was granted the inventor of this preparation."*¹⁷ Our findings indicate clearly that Pepsodent can-

¹⁷ General facts regarding the patent on Pepsodent are quoted, as follows, from a copy of a Pepsodent pamphlet (1915), entitled "The prevention of dental decay and pyorrhea" (p. 4): "In January, 1914, a method was discovered by which pepsin can be used in a dentifrice for the purpose of digesting the dental mucin plaques, without injury to the enamel; and on March 23, 1915, United States patent No. 1,133,250 was granted the inventor of this preparation, the descriptive name of which is *proteolytic tooth paste*."

The 1917 edition of the Pepsodent pamphlet (*loc. cit.*, 2 above, preface)

not be accurately or appropriately called a "proteolytic tooth paste," if that "descriptive" phrase is intended to ascribe to Pepsodent the property of materially or effectively digesting protein ("that film") from the surfaces of the teeth, when Pepsodent is *used as a dentifrice*.

It is claimed by the Pepsodent Company, and we have found, that Pepsodent effectively *stimulates the production (and increases the alkalinity) of saliva*, when Pepsodent is used as a dentifrice. Digestion of albuminous matter by pepsin occurs only in the presence of hydrogen ions in sufficient proportion to make the containing medium *appreciably acid*. The saliva that responds to the stimulus from Pepsodent is promptly mixed with the latter, in its use as a dentifrice; the "acid" in the Pepsodent thus taken (small in amount, at best) is then speedily *neutralized*; and any possible influence this "acid" might otherwise exert, as an "activator" of the pepsin in the dentifrice, is thus promptly and completely *nullified*. The more effectively a given amount of

states that Wm. M. Ruthrauff, A.B., A.M., "discovered the principle on which Pepsodent is based and five governments already, by granting him patents, have certified his originality—also the correctness of his basic claims."

That Ruthrauff did not "*discover*" this "*principle*" (the possibility of enzymic digestion of mucin plaques by dentifrices) if, by "discovery," he means first public reference thereto, will be recognized by those, among others, who heard the oral reports of research, by the senior author of this paper, at the meetings of the First District Dental Society, prior to 1914. The senior author would not endeavor, however, to disturb Ruthrauff in the enjoyment of the property rights his patent gives him, especially because he (Gies) has referred to this "principle," in discussing the dentifricial value of *such fruit juices as that from pineapple*, only to allude to the plausibility of the "principle" in theory but its minor efficiency in practice, in relation to the prevention of dental caries *by dentifricial removal of mucin plaques*. [Pineapple juice is among the food-acid media the senior author has recommended, also, for the superficial (oral) treatment of pyorrhea. This fruit juice, with an acidity equal in degree to that of 0.4 to 0.5% hydrochloric acid solution, contains protease (bromelin) that digests proteins not only in *acid* media, but also in *neutral* or *alkalin* liquids—a protease that is far more adaptable to oral conditions than pepsin can be, and which would be a far more logical constituent of Pepsodent than pepsin ever could be.]

The senior author's attitude on the matter of patent may also be inferred from the following statement (published by him) in the JOURNAL OF THE ALLIED DENTAL SOCIETIES (1914, iv, p. 327):

"The speaker reminded the Society, in this connection, that he had never accepted any payment whatever for his services as the Society's instrument in these investigations, despite the fact that his only income is his salary as a university teacher—that he accepted the Society's invitation, four years ago and its annual renewals, as calls to special public service. He further declared that he would adhere to this ideal of service in the future—that he would accept no remuneration; and, also, that under no circumstances would he consent to destroy the happiness this work was affording him, or subject his motives to suspicion, *by putting on the market through a private agency any product that might be supported by the findings of any of his researches*. He believed that the Society, if it followed his suggestion (to guide and protect the public in the selection of dentifrices), could set an example in professional loyalty that would be of inestimable public service, directly, indirectly, and continuously. He urged all present who might be connected with the exploitation of commercial products of doubtful value—and he said he had been reliably informed that several members of the Society are thus commercially related—to break such connections, in the interest not only of personal self-respect but of higher and more faithful professional influence."

Pepsodent stimulates the flow of alkaline saliva, the more speedily is any possible digestive action by such Pepsodent, on mucin, prevented or eliminated. The prophylactic dilemma of the Pepsodent Company, in its double claim for Pepsodent in these respects, does not appear to have occurred to the Company or their counsel.

That Ruthrauff and the Pepsodent Company do not seem to understand the mutually destructive nature of their claims that Pepsodent simultaneously stimulates the flow of alkaline saliva, and digests mucin plaques, is shown, further, by Ruthrauff's comment and directions, stated as follows in the 1917 edition of the Pepsodent pamphlet (*loc. cit.*, 2, above, p. 16) :

"Pepsodent produces a *copious* flow of saliva. Retain this until through brushing by holding the head well back. Then force the paste, *dissolved* in saliva, vigorously back and forth between the teeth. This stimulates the gums, removes food particles, and gives Pepsodent a chance to reach all tooth surfaces."

No better physiological method could be devised completely to neutralize any digestively effective acidity a given quantity of Pepsodent possesses, and wholly to nullify almost immediately the activity of any pepsin contained in the dentifrice, than the process described by Ruthrauff in the foregoing quotation.

It is well known that, even under very favorable conditions, digestion through the agency of pepsin is a *relatively slow process*. The only allusion to this important point in the Pepsodent advertisements, that we have noted, is worded as follows in the Pepsodent pamphlet (*loc. cit.*, 2, above, p. 16) :

"Bear in mind you are using a digestant, and *digestion is not instant*. Use it (Pepsodent) freely, *without diluting in water*, so you get its *full strength*."¹⁸

But, if one should "*bear in mind that digestion is not instant*," and then, "retain this (saliva-Pepsodent mixture) until through brushing by holding the head well back and forcing the paste, *dissolved* in saliva, vigorously back and forth between the teeth," why should one expect *pepsin*, dissolved in the neutral or

¹⁸ If Pepsodent should not be diluted with neutral water, "so you get its full strength," why is it desirable to dilute it with alkaline saliva, by the process recommended in the last preceding quoted direction?

alkalin salivary-dentifrice mixture thus speedily produced, to do anything to "that film on the teeth"?

It is claimed repeatedly by the Pepsodent Company that the "whole object of Pepsodent is to *dissolve* the film" (1), that digestion will *dissolve* it" (2), and that pepsin is "Nature's perfect digestant" (2) of such albuminous substances as comprise the mucin plaque. Nevertheless, the inventor and the manufacturers of Pepsodent do not appear themselves to believe, or to have found, that the *pepsin* in their product is able to accomplish the removal of "that film" from the teeth, *by digestion*, for they include in Pepsodent *an abrasive to effect removal mechanically* (5).

If Pepsodent is a useful dentifrice, we believe its value depends jointly upon its physiological acidity and the mechanical effectiveness of its abrasive.

We suggest to Ruthrauff that trypsin would be more useful in his paste than pepsin can be.¹⁹ (In foot note 17 we suggested that bromelin would also be better than pepsin.)

V. Summary of general conclusions.

Pepsodent is an *acid* tooth paste which contains a proteolytic enzyme that acts *very feebly like pepsin* under particularly favorable *laboratory* conditions.

This acid tooth paste, *when used as a dentifrice*, promptly increases both the *volume* and the *alkalinity* of the saliva.

The reputed digestive action of the peptic enzyme in Pepsodent, upon mucin plaques on teeth, *when this paste is used as a dentifrice*, is impossible, we find, for two experimentally established reasons: the digestive power of Pepsodent is insignificant to begin with, and *the acidity upon which Pepsodent's feeble initial peptic power depends* is largely neutralized, or wholly removed physiologically, by the alkalinity of the accompanying voluminous saliva before the enzyme can possibly *begin* effectively to dissolve "that film on the teeth."

Any special value that may properly be ascribed to Pepso-

¹⁹ We assume, of course, that Ruthrauff knows that trypsin is active in solutions of acid calcium phosphate. Neutralization of this phosphate, by the basic compounds in saliva, would not interfere with the activity of trypsin as it does with that of pepsin. With trypsin, Ruthrauff could dispense with the acid activator and use calcium *chlorid*, instead, for his calcium therapeutics.

dent, for the prevention of dental caries—from *clinical observations* on the practical use of the paste, for example—would appear to depend upon the physiological kind and degree of acidity (acid phosphate), and the mechanical effectiveness of the abrasive (tri-calcium phosphate), in this acid dentifrice.

In a future study, we hope to compare the prophylactic properties of Pepsodent with that of other dentifrices, especially from the standpoints of its acidity and abrasiveness.

Addenda

In a letter dated March 24, 1917, addressed to the editors of several journals, the senior author referred, in a preliminary way, to the foregoing findings. This letter was published in the *Dental Outlook* (May, 1917), where, unfortunately, it was given the inaccurate heading: "*Pepsodent devoid of scientific merit.*" Nothing in the letter under the heading warrants this sweeping allegation, for the letter denies only the claims by the Pepsodent Company to the effect that Pepsodent removes, and prevents the formation of, mucin plaques by the *patented* feature of this dentifrice, viz., by *solution* and *digestion* of such plaques and their protein constituents through the agency of pepsin.

We believe that Pepsodent *does* have "scientific merit" as a *cleansing* mixture through the mucin-curdling and salivary stimulative actions of its unpatentable physiological acidity (see page 374) and through the agency of its unpatented abrasive, although we are not satisfied that the "gritty" phosphate used in Pepsodent is entirely harmless mechanically, as that substance would be if amorphous, *precipitated*, tri-calcium phosphate, properly prepared and selected, were exclusively employed instead.

In a recent full-page Pepsodent advertisement (*Dental Cosmos*, April, 1917) it is stated that "an alkali tends to harden mucin." It has been so well known for many years that alkali renders mucin soft, viscid and soluble, that a published misstatement as striking and inexcusable as this should be publicly explained.

REMINISCENCES¹

BY ROBERT R. ANDREWS, D.D.S., A.M., CAMBRIDGE, MASS.

I HAVE been asked by your committee to give some reminiscences of the Boston Dental College, perhaps because I am one of its oldest graduates, and have been connected with it in one way or another for almost a lifetime. Longfellow has said, "You don't know what it is to be seventy years old; I will tell you, so that you may not be taken by surprise when your turn comes. It is like climbing the Alps. You reach a snow crowned summit, and see behind you the deep valley. Stretching miles and miles away, and before you, other summits, higher and whiter, which you may have strength to climb, or may not. Then you sit down and meditate, and wonder which it will be. That is the whole story. Amplify it as you may, all one can say is—that life is opportunity."

I have accepted the invitation of your committee with much pleasure, because reminiscences of the Boston Dental College, its birth in storm, and its growth in the sunshine of prosperity, recall many memories of my old professors, classmates, and many of our alumni, now no more.² It is my intent simply to sketch some of the men who have helped to build up our school. To do this adequately in the space of a paper like this is not possible. The effort to do so, however, may serve to convey, in some degree, the esteem in which these men are held by many members of the old College.

In the early years of our State Dental Society, I was a junior member. This was at the time our college troubles began, for our school was born in a storm of opposition. In the early days of the State Society, Dr. N. C. Keep, the president, in his annual address suggested that a chair of Dentistry be established in the

¹ Read at a meeting of The Boston and Tufts Dental Alumni Ass'n, Boston, March 31, 1917.

² For some of my data, I am under obligations to Dr. E. O. Kinsman and Dr. W. E. Boardman, who kindly loaned me books, from which I have quoted.

Harvard Medical School. Dr. I. J. Wetherbee made the motion that a committee of three be appointed to meet with the authorities of the Medical School to arrange for the establishment of a professorship of dentistry in their Faculty. The medical authorities agreed to establish such a Dental Chair provided the man proposed should hold a medical degree. Dr. E. G. Leach, one of the most influential members of the Society, and a graduate of the Pennsylvania College of Dental Surgery, with Dr. I. J. Wetherbee, opposed this; they did not believe men holding medical degrees were as well fitted to teach dentistry as men holding dental degrees. They held that a diploma from a reputable dental school should have the same value, in preparing a man to teach dentistry, as a medical diploma has in preparing a man to teach medicine. They claimed there was a principle involved.

The antagonistic action of the Society to this principle was one of the things that hastened the formation of The Boston Dental Institute in May 1865. At any rate the Institute was organized with seventy members, and Dr. I. J. Wetherbee was its President. Monthly meetings were held and lectures on dental subjects were given by some of the ablest men in our profession. It lived for three years when it was superseded by a charter establishing the Boston Dental College. It was the original intention of the founders of the Institute to grant diplomas after a course of lectures, but it was found that the state would not sanction this, and in consequence of it Prof. Wetherbee endeavored to interest his professional friends in starting a second dental college, where they could give diplomas.

The Harvard Dental School had just been established. Some of you, perhaps, remember what a perfect bedlam of opposition took place in the meetings of the State Dental Society at that time. The friends of the Harvard School claimed that the idea of a second college was wrong in principle and that there was no necessity for a second dental school in New England. The debate was exceedingly aggressive, and decidedly personal. Among those in the State Society who were in favor of establishing the Boston Dental College, Dr. I. J. Wetherbee loomed up head and shoulders above them all. He was a tall, ministerial-

appearing man, having a distinguished bearing, a keen eye, and an intensely positive nature. Dr. L. D. Shepard led the forces of the opposition, and he was a man who was equally positive, and fully as aggressive, but perhaps a more scholarly, brilliant, and convincing speaker. It was a battle royal to the end. I do not remember, in all my dental society experience, such a heated war of words, or such exciting discussion as that which occurred on the evening of May 21st, 1868; later it was repeated before the State Legislature; but our College was established in 1868, and the two schools have continued to flourish, side by side. In 1899 the Boston Dental College was taken over by Tufts College and associated with its medical school. It is now said to be one of the largest dental schools in this country.

Prof. Wetherbee, as he was ever afterwards known, was the first president of the College. He was also chairman of the Board of Trustees, and chairman of its Executive Committee. In fact, he was almost "the whole thing;" and the college was at that time called "Wetherbee's College." But Prof. Wetherbee was a leader. He was a man of unquestioned ability, and had a splendid practice. His aggressive nature caused the ill will of many of his profession, but he was intensely interested in the College, and he did an immense amount of work for it. As a teacher he was conscientious and able. He died of heart failure, June 24, 1892, in his 85th year.

The first rooms occupied by our Dental School were, if I remember rightly, at No. 5 Hamilton Place, nearly opposite Park Street Church. When I attended the College in 1874 it was located on the second and third floors of a building which stood at the corner of Dover Street and Shawmut Avenue. The street floor was occupied by a drinking saloon. Our Faculty consisted of Professors Wetherbee, Lawrence, Follett, Ogden, Wadsworth and MacDougall; our lectures were given afternoons and evenings. This arrangement was made, I think, to accommodate men who were in practice who could not give their mornings to the work. All this was changed in 1877 and a new college home was established at 485 Tremont Street, near Berkeley. In the new building the rooms were large, occupying two whole floors, and they were supplied with all the conveniences and

apparatus necessary to a clear and complete course of instruction for dental education.

The next home was at 593 Tremont Street, corner of Clarendon and Montgomery Streets. Here the College had at last spacious and suitable apartments. The first floor, the Infirmary, was a very large, well lighted room with some 50 or more chairs, and there was also a well furnished private operating room for the use of the Professor of Clinical Dentistry. The second floor was devoted to the mechanical department. The third floor was occupied by the library, lecture and extracting rooms, the lecture rooms accommodating 100 to 150 students. The chemical laboratory and the dissecting room occupied the fourth floor. Everything in this building was up to date. Our next home was at the Tufts Dental College on Huntington Avenue.

Among the brilliant teachers who were associated with our school at various times was that grand old man, William H. Atkinson, A.M., M.D., D.D.S. Everybody knew and loved "Pop Atkinson," as the boys used to call him. He was really one of the great masters in dentistry, and when he spoke there seemed a radiation of electric enthusiasm and magnetism all about him. You could almost see it. He was splendidly educated, although his language was in many instances above and beyond his audience. For instance, he might make a statement something like this in his description of a condition: "There will be found something reticulated or decussated at equal distances, with interstices between the intersections" and so on. As a young man I used to wonder what he was talking about, but as I got older, and knew and understood him better, I found out what he said was true. Such men burst forth into the world, like a meteor of blinding brilliancy. He gave me inspiration, and great encouragement, when I was working at my original investigations. He was interested and enthusiastic over my slides, and urged me on. I have been told he had received the highest fees of any dentist in America, on one occasion charging one thousand dollars a day for several days; and he got his fee, it is said. In 1868-69 Dr. Atkinson was our Professor of Hygiene and Dental Jurisprudence, and in 1870 of Operative and Clinical Dentistry. He was the idol of his students, and was held in the

highest esteem by the dental profession in this country and abroad. He died in New York in his seventy-seventh year.

Dr. George W. Harriman, a graduate of the College of the Class of 1870, was one of its firmest friends in its early days. I have been told that he advanced a considerable amount of money to tide over when funds were low. He was one of eight graduates who met in the old lecture room of the College, No. 5 Hamilton Place, Boston, on the evening of March 4, 1872, and there formed the Boston Dental College Alumni Association. At one time he was Dean of the College, and in 1897 he was its President. He was also one of its professors, and a member of its Board of Trustees. At a time when funds were very low Dr. Harriman took the few students into his office, where lectures were delivered and instruction given. He was an expert microscopist, and owned the highest magnifying objective ever made in this country, a 1/75 inch. He died May 22, 1905.

Dr. Samuel J. MacDougal, a physician who practiced dentistry, was a thoughtful and earnest man and was well known in medical and dental circles all over New England. He was the original founder of the Massachusetts Dental Society and its 13th President. He held the chair of Dental Art and Mechanism in the College in 1869, and in 1874 was its Professor of Pathology and Dental Therapeutics. He was a popular professor, a very earnest and inspiring teacher. He admitted his students to his office as familiar friends and was ever ready to advise and instruct them. He died in 1907.

Perhaps no one served the College longer than John B. Cooledge, M.D., D.D.S. He was a medical man before he entered our College. During the Civil War he went to Washington and practised dentistry in a temporary hospital near the White House. He was rather an eccentric genius, ever experimenting, and in many respects a brilliant man. With Dr. Wetherbee he started the organization of our College, and was a member of our Board of Trustees. He was for many years the Secretary, also a professor, and served the College for 27 years. He was an exceedingly skillful mechanic, and an inventor of no mean order, many of his inventions being valuable, and in use today. Always a clever operator and untiring in his interest in his

students. Before he died, he was known as the oldest practising dentist in the country, hale and hearty at ninety years of age.

One of the most brilliant men we ever graduated from our school was Dr. Albion M. Dudley of the Class of 1869. He distinguished himself as a soldier in the Civil War, winning a lieutenancy by sheer bravery, and was afterwards breveted a captain for the same reason. He was for years the brilliant Secretary of the American Dental Association, and an honored member of many societies. Dr. Dudley and Dr. E. G. Barton formed the entire first class graduating from the Boston Dental College. He was a professor in our College in 1870. He died in Salem, March 7, 1899.

We older graduates remember with affection our old Dean, Dr. John A. Follett. The students of the college loved this man, and pleasant memories of him are vivid, even today, with the old graduates. He was kind and sympathetic to all. He inspired faith and courage in those students who needed it. His home, near by College while I was there, was always open to those seeking advice or guidance. Continually doing little acts of kindness, he was altogether an ideal dean. The students found the College more interesting because he was in it, and of it. His simple courtesy made every student feel him to be a friend. Also a brilliant and loved professor, all of his old students sincerely mourned for him when he passed away. I wish also to pay my tribute to his wife, for Mrs. Follett was a woman of much refinement. She was very much interested in the success of the College, and always had a kind word to welcome any student who had business with the dean at his home office.

Professor Ambrose Lawrence, a graduate of the Pennsylvania Dental College, Class of 1866, was a trustee of the Boston Dental College. For six years he was President of the Merrimack Dental Association. He was a diamond of the first water, and a clear-minded lecturer. He was the discoverer of the famous Lawrence's Amalgam, and a very practical man; an earnest teacher, very popular with his classes.

My first office was in the house of Dr. D. G. Williams on Tremont Street about where Keith's Theatre is today. This was

about 1865. I did Dr. Williams' plate work, and so had the use of a small room in which to operate for such people as dared to test my skill at that time. I did know something, perhaps, about laboratory work, but little about operating. This was 10 years before I graduated. Dr. Williams was a man of striking appearance and was said to resemble Mark Twain. He was a courteous gentleman of the old school, a graduate of our College in 1871, and served for a time on the Board of Trustees.

Another friend of the old days was Dr. C. G. Dacis, a Dartmouth man, who possessed a broad and vigorous mind, nobility of character, a rugged honesty of professional endeavor in his work that seemed to emanate from the granite hills of his native state, New Hampshire. He was the 16th President of the Massachusetts Dental Society, a professor in our College in 1868, was a zealous worker and teacher, and recognized as an authority by the whole profession, and by the students under his care.

Dr. D. B. Ingalls, a graduate of our school, and a good friend, was the 18th President of our State Dental Society. He was a member of the Board of Dental Examiners from 1885 to 1890. He was also an ex-President of the Merrimack Valley Dental Society in 1874. He graduated in the Class of '74; he was a fluent, logical and ready debater, as well as a most conscientious and skillful operator. He died August 19, 1909.

Dr. Henry T. Bishop, another friend, was a very lovable man. He was a trustee of our College in 1868, and a Professor of Dental Art and Mechanism the same year. He graduated from the Baltimore Dental College in 1854. He was in practice for fifty years in this country and in Germany. In Germany he was the dentist of royalty, and tells on one occasion when he went to the palace of Prince Albrecht to attend to the teeth of the children, how shocked the attendants were when he took up the little prince, and kissed him. He says, "When I told the incident at home to the German household, I realized the enormity of my offense in the eyes of the simple German ladies with whom I was living." He was a noble friend and a courteous gentleman. His life was beautiful to its close in the ripeness of its well-filled years.

Dr. Harry S. Draper, one of the foremost among the men

who gave time and valuable work towards building up the high standard of our College, is still living. He graduated in 1884. He was elected President of our State Society in June, 1898. He was a trustee and a clinical instructor in our School in 1885; he was an active fellow of the American Academy, and of the Boston Society of Dental Improvement. He served our College most faithfully. He was Secretary of our Board of Trustees from 1895 to 1903. Dr. Draper's work will long be remembered by every grateful member of his profession and by the Alumni Association; he was President in 1892.

Dr. W. L. Bowdoin, a distinguished member of our profession, a man universally respected, was of the Class of 1870. In 1879 clinical lecturer, in 1880 our Professor of Clinical Dentistry, and he was a member of the Board of Trustees in 1870. A man of sterling professional and social qualities, and was active in promoting all good movements that seemed to him necessary for a sound dental education for his students.

I cannot refrain from paying my tribute to my old classmate and friend Dr. Charles Osgood, a graduate of the class of 1875. For many years an active member of the Board of Trustees, and much of the financial success of the last years of the Boston Dental College was due to his forethought and unceasing energy, an exceptional man and a splendid operator. Then there was my almost life-long friend Dr. Stephen G. Stevens, my chum, an earnest man, who graduated in 1877,—a working trustee, and the auditor of the College for years. In his chosen profession he filled many offices of honor and responsibility. Students always found Dr. Stevens a firm and true friend. His nature was that of a strong, sincere man. This quality gained for him the affection of all that knew him. He was a past-President of the State Dental Society, and also of the New England Dental Society. For years we had our vacations together. We were in Europe together. I knew him and think of him as one of the best fellows I ever met. He was skillful, ever anxious to excel, a fine operator, but the man was more and better than the dentist. He was the most gracious of men in his own home and fond of the society of his numerous friends. He died in Boston, September 4, 1904.

Another one of the old alumni was Dr. J. Warren Ball, a

graduate with Dr. Stevens in the Class of 1877. He gave many years to the education of our early students and was active in the Alumni Association; as an operator he had few equals, and his friends were legion. He was a brave and brilliant soldier in the Civil War, a member of the Loyal Legion and the Boston Art Club. He was a sincere friend, and men were attracted to him by his ability, his manliness and his good fellowship.

There is a tribute to be paid to Professor Edwin H. Branigan, perhaps one of the best executive officers we ever had. He was the professor in charge of the College Infirmary, with many instructors and demonstrators under him. He was a graduate of the Class of 1883 and one of the prize students. He devoted his lifetime to his work. His special qualifications fitted him for this, and he conducted his department, for the most part, in a masterful manner that won for him the respect of Trustees, Faculty and students. To him there was no other department in the school worth considering. Dental education meant fine operators, and he did his best to produce them. Whenever I called at the Infirmary as one of the visiting board I was always greeted with a pleasant word. He took pride in pointing to the large waiting list of children, many coming from institutions with their nurses in charge. He took pride in showing special cases under his care, seemed to be very gentle to those little patients who came with timidity almost amounting to fear, and he would receive them with a kind word and a pleasant smile that won their confidence, as they were assigned to the dental chair.

Dr. James M. Daly, Dr. Wm. P. Leavett, Dr. R. L. Robbins, our first Treasurer, Isaac C. Ayling, Josiah W. Ball, Godfrey Morse, Thos. W. Clements and Dr. Geo. H. M. Rowe, Supt. of the City Hospital, together with Hon. Chas. H. Allen and Stillman B. Allan as well as others who are living and who are known to you were some of the eminent men who served on our Board of Trustees at various times. N. N. Noyes was a Trustee and a very popular professor. Our past trustees, professors and instructors have been honored by the dental profession all over the country. Most of them have held the office of President of our State Society, and are honorary members of professional

societies outside of our State. Their labor has succeeded in establishing, on a firm foundation, a healthy, flourishing and permanent educational institution for the training of the men who come to us to be educated. All honor to these early fathers. Their thought and labor have made our College what it is today.

Among the living graduates of the old College who have done a splendid service, are Prof. Geo. A. Bates of the Class of 1889, a man universally honored by his associates, Prof. Geo. C. Ainsworth of the Class of 1875, my classmate, and a man with an international reputation, Prof. Joseph K. Knight, Class of 1883, for years our Professor of Mechanical Dentistry, Prof. William Rice of the Class of 1888, and Prof. H. H. Piper of the Class of 1889, Prof. W. P. Houston, Dr. E. O. Kinsman, and many others familiar to all of you.

Prof. William Rice with the assistance of his well chosen staff has conducted during the past year the afternoon clinic at the school in a masterly manner. His high standing and professional qualifications have gained for him the fullest confidence of the Trustees, and of this association. To-night we honor ourselves by giving this banquet to Professor Rice, the man we wanted—our Dental Dean.

Massachusetts Avenue, Cambridge, Mass.

IDEALISM

Essay Read in the Senior Conference Course in Theory and Practice, College of Dentistry, University of Minnesota.

BY M. R. HERRMANN

THE term idealism conveys to the average mind a state or being embodied by an individual and shrouded in a mystery of abstractions. A person possessing ideals and allowing them to be interpreted by himself in his every-day life is frequently regarded as eccentric and abnormal. As a matter of fact everyone practises idealism with a difference in degree. One general defect in our common application of idealistic principles, however, is that we employ them in a deceitful manner. We pose as idealists in the service of humanity, and then turn about and apply ourselves to gain materialistic and selfish compensations. In an effort to present the theme of this paper by portraying examples of its adaptation to life, it may add to its comprehensiveness to refer to concrete definitions and ideas.

Idealism, as a word, means the practice and employment in our daily activities of certain high conceptions of achievement that are particularly prominent and noteworthy in our inner self, with the aim of bringing them to a state of perfection. The inner self of man is commonly conceived of as an internal desire of thirst and hunger. What we aim to understand as the inner man in this discourse on idealism is the united product of the spiritual, mental and physical being of man, which is expressed in the emotions and sensations that adapt us to our fellow-men and habitat. Idealism then is something of an abstract nature, but which contributes to our life, and if practised, makes possible an appreciation for experiences that make living worth while. "A life that has no ideal is a torture to itself," says James. Often we hear people who have met with some disaster that has disturbed their pursuit in life for a time, remark, "What

is the use of living? I have nothing to look forward to." Such a life is not living; it is merely existing. A sustaining hope for an individual who arrives at such a stage is an anchorage in some spiritual ideal that will epitomize his period of distress.

The necessity for ideals in the individual life to warrant joy and pleasure to live it has been made apparent by idealists and philosophers from the beginning of time. The psychologist defines an ideal as an aspiration for something that is within our reach but still not within our grasp. A true ideal is an achievement or an expression of a motive that imparts infinite pleasure to the soul independent of the ultimate result. The Red Cross nurse, the artist, the research professor, and the proclaimer of the gospel may be individuals of diverging characteristics, but each one possesses specific ideals. These may be to relieve suffering, to achieve perfection in art, to verify something in doubt, or to bring men together in a common bond of brotherhood. Not one of these individuals can perceive the definite outcome of their efforts, but it is a sensation of internal gratitude which spurs them on in their work. A life instilled with an eagerness to do, self-forgetting, and concentrating on a process of living with perfection as the goal, becomes genuinely significant. It is quite impossible for man to attain the perfection of an ideal, for it extends into infinity, but nevertheless he must strive to reach it. "Well it is for us that we cannot reach a state of perfection," says Stevenson, "for the moment the fruits are being eaten, things become ignoble. What our human emotions seem to require is the sight of the struggle going on."

Individual success in life depends largely on how suited a person is for his work. "Happy is the man who has found his work," is a proverb often heard quoted. Why is he happy? Because he is successful in his occupation, he finds expression for a dynamic force his ideal. You and I have had the experience of completing some task that demanded care and patience, but upon its completion what satisfaction and pleasure was it not to see it finished. Some one else seeing it could not feel as we did. Why? Because he is external to it. To us it is the concrete presentation of an ideal that we attempted to express as perfectly as we were able. The ideal still exists, for we feel that at another

time we can produce a more exact, a more precise piece of work. Stevenson calls our attention to the statement that "no man lives in the external truths among salts and acids, but in the warm, phantasmagoric chambers of the brain, with painted windows and storied walls." Still it never occurs to any of us to wonder what was going on during a certain mental process or what it might be worth if it were expressed in the concrete.

The professional world, no doubt, provides its share of opportunities for the practitioner to exploit the public for material gain. No one so far has been able to beat the game of life. Why then go contrary to our convictions and even endeavor to evade the divine command emphasized by Tolstoi—"In the sweat of thy face shalt thou eat bread"—by unfair methods and unjust treatment. "There is a life, and there, a step away, is death." Hearing that, we say, "What does it all amount to in the end?" Then we stop to consider that no material compensation is permanently in our possession. Only that is permanent which is transmitted to our soul through the expression of an ideal that gives an invaluable benefit to the welfare of someone else. Such a compensation alone can render a life more radiant and give it greater buoyancy in time of trouble.

We who are equipping ourselves for the dental profession have somewhat of an insight as to what is expected of us in practice. Next to medicine, dentistry offers activities of interest to our physical, mental and spiritual being found in but few professions. We have the opportunity of living a true life from several standpoints of human ability, and that can be accomplished by a timely perception of our relation to the universe and the mission we are to fulfill. Henderson says, "There is but one interest in life, and that is the human interest." We as dentists, then, have a big and noble chance to partake of the service for that interest. Many questions, however, enter the minds of students before they reach their chosen field of activity. One of the common mental perplexities confronting the students who have gone into debt for their education is the question, Are we going to be successful and are we suited for the dental profession? The question to ask ourselves, then, is, Why did we choose to take up dentistry? Was it because we wanted a way of

making an easy living, or was it an egotistical ambition for a title? If such motives prompted any of us to take up our life work, we have erred, and have no license to expect good fortune or success to come our way. It would be a very absurd statement to say a man faced failure if the above incentives encouraged him to take up the profession. He no doubt will derive a livelihood, but will that alone satisfy him? If his work is a burden, and he continually longs for a time when he may abandon it, no happiness can come out of his misapplied life.

Tolstoi asserts "that the life of each man is a movement somewhere; whether he will or not, he moves, he lives." According to that idea but one thing remains: "back out," and start up a different avenue in life, or conceive the demands that the profession expects of you and interpret them in your practice. The question is naturally suggested, What does the dental profession require of me and what am I going to receive in compensation? Dentistry is not an occupation that invites financial exploitations. That fact has been presented to us, no doubt, through our observation of men in practice. No industry serves its master; the master serves it. He is the potential force that causes the wheels to turn, the ships to weigh anchor, and the trains to move.

We also are called upon to do, to serve, not because we are obliged to but because we love to. Let the service that we can render to our fellow-men be our ideal, that expression of a zeal to relieve suffering, to be of aid to health, to encourage the æsthetics, and to elevate the dental profession by teaching its necessity as a factor for human welfare. To express an ideal more truly it should be divorced from the aims of individual benefit to that of the group or the community. A dentist doing conscientious work receives but meager fees for his services. If he expects to have his efforts compensated for in dollars and cents, he will never be paid in full. The sensation of achievement of doing good to others, of aiding some one in need—that a dentist can experience in his practice every day. Is it not that inward contented feeling that inspires one to continue working? It is a gratification that exists prior to all pecuniary imbursements; the expression of an ideal. It is that composite product of man's physical, mental

and spiritual ambitions, acting in unity with the aim of attaining perfection in whatever he chooses to do of a noble order.

In concluding this treatise, a more comprehensive means could not be resorted to than a brief outline of the requisites necessary to guide us in the pursuit of the ideal life. This can be done most effectively by quoting the words of some of the most noted teachers who lived a full life and determined a solution for some of its problems. Among the three instructors of life's principles who are to be quoted, Christ is the foremost one. He was the greatest idealist that ever lived among men. In His remark pertaining to the desires of the flesh or physical being of man, He says, "Deny thyself." Secondly, the moralist, Marcus Aurelius, considering the emotional and spiritual being of man, said, "Control thyself." The third, a discreet philosopher, Socrates, viewing the intellectual and mental being of man, said, "Know thyself." The interpretation of the advice contained in these six words, "Deny thyself;" "Control thyself;" and, "Know thyself," will make our lives more ideal, more worthy of living, and of more value in the service of humanity. Then there need be no anxiety about the success we desire to attain, for it will turn out to be, as it is said, "He who serves best, profits most."

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EDITORIAL DEPARTMENT

A NOTABLE ACHIEVEMENT

Elsewhere in this issue of THE JOURNAL will be found facts and details concerning the recent work of The Preparedness League of American Dentists¹ in examining and putting into condition the teeth of the men of the National Guard of the State of New York, prior to the Federalization of our State forces. The work was undertaken on June 15, under instructions from Col. M. S. Terriberry, Chief Surgeon of Division, N. G., S. N. Y., and by dint of speedy and efficient organization work the enormous task of examining and caring for the teeth of seventeen

¹ See p. 410.

thousand men, on the lines indicated, was accomplished in a little less than five weeks. The practical patriotism, the practical capacity for meeting a great national need, on the part of the dental profession in the State of New York has been demonstrated in that most impressive way—the actual performance of the work needed.

Necessarily the work undertaken was of an emergency character. The great object was a general “clean up” of sources of immediate oral infection by the removal of pulpless and broken down teeth and the filling with amalgam or cement of the large cavities in teeth which could be saved. The work was superficial, but the greatest amount of good to the greatest number in a very limited time were the terms on which this novel campaign was prosecuted. The guardsmen were examined in their armories; the men assembled in open ranks, standing at attention, while the dental examiners, with tongue sticks and flash lamps, passed rapidly from man to man, reported “extractions,” “fillings” or “both” to clerks provided with printed slips for individual records. Lists being made from these in duplicate, one copy was forwarded to the League’s headquarters at the Academy of Medicine, and the men reporting for assignment, were given appointments with the dentists at their offices. Frequently an entire regiment would be examined in a single evening by members of the League, and the work would begin next day.

The official report, when published, will be of great interest to all concerned in the health of our armies—not merely as a record of achievement, but as an indication of what may be done throughout our country by the organized effort of all registered dentists. The following totals are significant:

Total fillings Manhattan, Brooklyn and Bronx.....	8,217
Total fillings outside of New York City.....	1,491
Total fillings.....	9,708
Total extractions Manhattan, Brooklyn and Bronx.....	9,260
Total extractions outside of New York City.....	1,584
Total extractions.....	10,844

Total examined Manhattan, Brooklyn and Bronx.....	15,040
Total examined outside of New York City.....	2,002
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Total examinations.....	17,042
Total with defective teeth Manhattan, Brooklyn and Bronx.....	5,016
Total with defective teeth outside of New York City.....	1,024
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Total with defective teeth.....	6,030
Total appointments given Manhattan, Brooklyn and Bronx.....	3,467
Total appointments given outside of New York City.....	585
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Total appointments given.....	4,052

We are well aware that much dental service, at great personal sacrifice, has been rendered by dentists in various organizations throughout the United States. The spirit and desire so to serve our country in its great emergency is patent everywhere; but with the assembly of the National Army the dental problem will become of such vast proportions that centralized organization of the highest efficiency will be needed. We suggest that the Preparedness League has proved its fitness to assume the great responsibility of becoming the avenue through which the dental profession of America at large shall render service to our fighting men. If such is the case, let every registered dentist volunteer, as a member of this organization, to give one hour of each working day, with the necessary materials, to the service of recruits sent to his office. We refer our readers to the statement by Dr. J. W. Beach, Chairman of the National Committee of the League, at page 410.

The Government will not accept gratuitous service to its enlisted men, but at this writing we understand that application has been made, by the League, to care for the recruits of the National Army on a basis of part time employment of the dentists by the Government at the nominal salary of one dollar per year. We are informed that this technical matter has been arranged, and permission given to proceed.

Our country is at war. The greatest decision ever made by the human race is to be reached by force of arms in the not distant future. This is not an affair of two, or of several nations;

the world is divided against itself, and the outcome of the struggle will involve alternatives no less than human liberty or bondage, spiritual light or darkness; happiness and peace—or misery and perpetual strife. Our valiant and war-worn allies look to the United States to bear a heavy brunt at this crucial time; perhaps the decision lies with us. Sheer man power, whether expressed by personal service or the results of labor, is needed in the utmost, and every good American should be thankful for the high privilege which has become his duty—to give of his best.

In all walks in life there are men who because of age, family responsibilities, or physical disability, may better serve their country at home than in the ranks. *No one*, whatever his state, is exempt from the obligation of service *costing personal sacrifice*, until the future of mankind is “made safe.”

We assume this to be the attitude of ninety-nine per cent of dentists in the United States not actually under orders today. The chance to “do his bit” lies before every self-respecting individual; let him *do* it, without delay.

IDEALISM

We have heard much in recent years of tendencies toward materialism, commercialism, the love of personal luxury—which have been undermining insidiously the higher phases of life in the nations of Europe and, chiefly, the United States. Three years ago our neighbors overseas were rudely awakened from their dreams of mammon, and since then have passed manfully through an ordeal more searching than the refiner’s fire. But a few months ago the call came to America to set aside the things men commonly strive for, and join the rest of the world in fighting for the things of the spirit. All that seemed nearest the heart’s desire is to be given freely to secure for future races of men those conditions of life which we count greater than life itself. The idealist is no longer the “idle dreamer of an idle day”: he is the man in the ranks, whether in the trench or at home; there are millions of him (and of her) and their daily work is service to fellow beings. The most terrible of wars has brought to the world its greatest age of idealism.

Professional men—especially those in medicine—are commonly regarded as unpractical idealists by their hardheaded friends in mercantile affairs. The latter smile at our lack of business or even common sense, at our disregard for principles of efficiency which are so highly developed in commercial life. Let us admit at once that much of the indictment is sustained—that we should improve our bookkeeping and habits of using money, that we should be businesslike in the rendering of bills for services and employ proper methods to insure collection. We should, in other words, adopt gladly every means of improving the output of our offices in service to patients, and logically, be entitled to an increased income, fairly earned. But let us be very careful that we do *not*, in the warmth of enthusiasm, transfer our chief concern from the problems at the chair to the alluring details of money getting.

There is a word used frequently in an excellent paper in this number of the Journal² which, though descriptive, places the emphasis at the wrong place in our day's work: we refer to "salesmanship." Mr. Anderson is entitled to a layman's indulgence in using this word, and we are indebted to him for much sound doctrine in his plea for a closer study of human character. The word referred to has been used commonly, however, in recent years, by dentists who felt inspired with wisdom obviously denied their less fortunate brothers, and the trend of their teaching has been that the dentist has something to sell, and along with the rest of the world, he should make that something of convincing attractiveness to his prospective customer. We commend to our readers' attention Mr. Hermann's paper "Idealism"³ which discusses effectively a deeper aspect of our work.

Every professional man—the dental specialist, the family physician, the clergyman—has something to sell, in that he lives by his daily work; but his offering is not a package of groceries. We object to "salesmanship" because through its suggestiveness the idealistic character of *personal service* to our fellow man is

² Anderson, S., *The Psychology of Winning and Holding the Confidence of the Patient*, p. 335.

³ See p. 389.

blunted and debased to the level of the barter of *impersonal* commodities. To be sure a loaf of bread may be as necessary to life as a surgical operation; but the latter is removed forever from the category of the former, in human estimation, because the surgeon has devoted his life in training to assume personal responsibility at that crucial moment in the life of another, while the baker makes his loaf—or a thousand of them, equally well, if he is prosperous—for the market price; and that is why he is “in business.” The dentist is *not* in practice, primarily, for cash receipts—although he should be and usually is, in receipt of a comfortable living for himself and family, with sufficient surplus to provide a competency in his old age. While all men work for “a price,” the distinguishing badge of the professional man is that life-habit of mind which subordinates the pecuniary motive, and exacts as primary, the conception of personal service.

As we have said, it is a matter of emphasis: the dentist should ever remember that, first and foremost, he is an idealist; that in this chief concern of his patient's welfare lies the true measure of success. Incidentally, he need not fear for his reward: it is the way of the world to appreciate, and to pay for, that which is best; but it must be the best.

CURRENT DENTAL LITERATURE

COMPILED BY ARTHUR H. MERRITT, D.D.S.

Titles marked with an asterisk (*) are abstracted briefly.

Boston Medical and Surgical Journal, *May 17, 1917.*

47 Mouth Infections in their Relation to Systemic Disease.

Paul A. Hudnut.

A plea is made for a more careful examination of the mouth by the physician in his daily practice. This should include general hygiene of the mouth, bridged and crowned teeth, dental caries, partially erupted third molars, gingivitis and pyorrhea. No physical examination can be regarded as complete which does not include a careful and painstaking examination of the oral cavity, inasmuch as in it, more often than in any other part of the body, may be found chronic foci of infection which may seriously prejudice the general health, that when such foci exist, steps should be taken to eliminate them as the only reasonable course to pursue.

Dental Cosmos, *May 1917.*

48* The Relation of Dental Infection to Systemic Disease. By E. C. Rosenow.

49* Consideration of Some of the Problems and Details of the Operative Side of Bridge-Work. By J. K. Burgess.

50* The Mouth as a Diagnostic Index. By G. R. Harrison.

48 The Relation of Dental Infection to Systemic Disease.

It is Rosenow's opinion that the relationship between dental infections and various systemic diseases has been demonstrated. The eradication of all foci of infection is advocated, the exact method to be followed being decided in each individual case. In cases of incurable pyorrhea, the teeth should be extracted. Pulpless and abscessed teeth should be regarded as a serious menace to health and with relatively few exceptions, their extraction is indicated. Too much should not be expected from the removal of a focus of infection, especially in chronic conditions, inasmuch as other unsuspected foci may exist. Moreover, recovery may be inhibited by local tissue sensitivity or peculiar mechanical conditions and living bacteria in a secondary lesion may continue the infective process independently of the focal source.

49 Consideration of some of the Problems and Details of the Operative Side of Bridge-Work.

In the Author's opinion, bridge-work as applied to dental practice,

should combine good surgery, good engineering, good artistry and good workmanship; that any operation which falls short in any of these respects is more or less of a failure. The excision of sound teeth and the destruction of pulps, etc., for removable bridge-work, is a crime against both surgery and engineering, and wholly without justification. The surgical principles involved in such procedure, are comparable to those of the surgeon who would amputate a leg to prevent the development of bunions, or advise the extraction of teeth in early life as a preventive measure against caries. The shell crown should be abolished.

50 The Mouth as a Diagnostic Index.

The statement is made that the dentist in his examination of the mouth, should bear in mind that the oral mucosa is often an index to serious systemic diseases, and that upon him rests the responsibility of recognizing and interpreting these clinical signs, and seeing to it that the patient is placed in proper hands. Attention is called to the prevalence of cancer of the mouth and to different diseases as they express themselves upon the lips, mucous membrane, gums, tonsils, tongue, glands, etc.

The Dental Review, May 1917.

51 The Pre-existing Lesions in the Oral Cavity and their Relation to Malignant Diseases.

J. C. Bloodgood.

In a report of 638 cases of cancer of the oral cavity, the statement is made that the most striking feature in the history of these cases was unsanitary mouths and neglected teeth, that the problem of cancer of the mouth can only be solved by educating the public in regard to mouth hygiene and good dentistry. It is the Author's opinion that it is as important to the health of the adult to keep the mouth clean and the teeth in good condition, as it is that the infant be fed clean pasteurized milk. Tobacco was found to be the second prominent etiological factor in cancer of the mouth. Among 163 males with cancer of the tongue or some other lesion, all but six were addicted to the use of tobacco. In ninety-nine cases of cancer of the oral mucosa, only three gave positive histories of never having used tobacco. The belief is expressed that in a large per cent of cases, cancer of the oral cavity is a preventable disease by early recognition of pre-existing lesions.

Journal of the American Medical Association, June 2, 1917.

52 Epidemic Ulceromembranous Stomatitis (Vincent's Angina) Affecting Troops.

A. R. Campbell and A. D. Dyas.

The Authors report 129 cases of Vincent's Angina, an infectious disease of the mouth, throat and bronchi; the mouth and throat being

the most common site. The largest per cent of cases were of the tonsillar type, a yellowish-white membrane covering one or both tonsils, which if not treated may extend over the soft palate, uvula and posterior walls of the pharynx. The gum margins were frequently involved and in some instances there was a general infection of the oral mucosa. The breath is fetid, there is slight elevation of temperature with increase of pulse and respiration. Vincents fusiform bacilli and the spirochete are invariably found to be present, their activity depending upon injury or lowering of tissue vitality. The incubation period of the disease is unknown. Arsenic in the form of salvarsan or neo-salvarsan is the most useful remedy. As these drugs are expensive, the Authors used liquor arsenicalis (liquor potassii arsenitis), swabbing it on the ulcerations three or four times daily. In case of deep ulcerations, this may be supplemented by swabbing with a 1 per cent solution of silver nitrate. In cases involving the gum margins, the following is recommended: Vinum ipecacuanhoe, $\frac{1}{2}$ oz., Glycerinum, 1 dram, Liquor arsenicalis sufficient to make 1 oz. A few drops are applied to the patient's tooth brush, and used in brushing teeth and gums two or three times daily. In general stomatitis, the patient should be given large doses of liquor arsenicalis, sodium cocodylate hypodermically, or salvarsan. The majority of cases clear up under this treatment in from four to seven days.

The American Journal of Roentgenology, *June 1917.*

53 Method for Dental Stereoroentgenology.

H. Letord and C. G. Lunan.

It is the Authors' belief that the stereoroentgenogram is superior to a single plate in clearing up doubtful points. The technic advocated, having made the exposure, is to change the exposed plate for a second plate, move the tube two and one-half inches and continue with the second exposure. The long edge of the rectangle indicating the position of the plate, should be parallel to the long supporting bars of the tube stand.

New York Medical Journal, *May 26th, 1917.*

54 Report of Six Cases of Dysphagia and Dysphonia of Dental Origin.

T. J. Harris.

The Author reports six cases in which there was either difficulty in deglutition or in speaking, due to dental abscesses or pyorrhea, which promptly cleared up by eliminating the mouth infection. Doubt is expressed as to just how the infection brought about these conditions, though it is believed that there must have existed an actual toxemia of the muscles concerned. While this form of toxemia is entirely new, it is not a rare condition and doubtless explains many

cases which have been regarded as pure neurosis. The Author, without any clinical experience in dentistry, recommends "not depending upon a mere examination of the teeth by any dentist, however competent he may be, but that every case should have complete and satisfactory x-ray films made. These, moreover, should be interpreted by one who is accustomed to do so and not left to some one entirely ignorant on the subject."

NOTES ON DENTAL PRACTICE

COMPILED BY WILLIAM D. TRACY, D.D.S.

Management of Soldered Cases.—All invested cases that are to be hard soldered should be heated gradually and uniformly, and cooled as quickly as possible with safety to the cases. Where no porcelain teeth are involved, as in removable-facing work, the cases should be quenched in cold water as soon as the solder has set, which makes for greater strength.—W. W. ATKINSON, *The Dental Cosmos*.

The Mouth from a Diagnostic Standpoint.—The care of the mouth would be attended to more carefully in all acute diseases if physicians now and then looked into the fauces of their acutely ill patients. It is surprising how often we can find foul conditions, the correction of which by very simple measures adds immeasurably to the comfort of the patients and enables us to feed them more readily; while a dirty mouth destroys the appetite, and, moreover, infects every morsel of food which enters it. Recent researches have proved that in all acute illnesses, the digestion and absorption of food are but little below that of health, and, moreover, that all infections can be fought better by patients if the waste of the body tissues is prevented. The patient should be properly fed, and a full supply of calories should be allowed him. Keeping the mouth clean is the first and a very important stage in securing this end.—GUY R. HARRISON, *The Dental Cosmos*.

Sharpening Hypodermic Needles.—A dull or rusty needle is a prolific cause of abscesses. Wipe the needle from time to time with crocus cloth, procurable at hardware or cutlery establishments. Have a good hone, such as the Wachita razor hone. Thrust the needle with the wire in through a bit of soft cork long enough to come within one-quarter inch of the beginning of the bevel of the needle. The cork serves as a handle and also holds the needle stiff. A few rubs upon the hone put a keen point on the dullest needle.—J. M. H., *Dental Review*.

To Remedy Faulty Contact Points.—To remedy a faulty contact point, filling material may be used. Amalgam limits the possibility of correct restoration because it is not hard enough to withstand the constant rubbing against it of the adjacent tooth without becoming more or less flattened. A gold foil filling, well condensed, is better, yet does not meet the requirements of the case as well as does the gold inlay. As a filling material for securing ideal contact points, the gold inlay is far superior to any other. It should fit as tightly as possible, even though its insertion prove uncomfortable to the patient. If a tightly fitting, or one might say an over-large gold inlay, is placed in a proximal cavity, the contact

points all along the arch will be tightened. The contact point on the inlay may be made of 18-karat solder, flowed over the 22-karat inlay. This gives the required hardness to withstand abrasion.—*Oral Health.*

Apicoectomy.—Apicoectomy, or root amputation, is only successful in selected cases and if thorough root canal treatment has preceded the operation. It is not sufficient simply to amputate the root where the old filling ends, but the canal and the dentinal tubules must be sterilized. Otherwise there will be reinfection from the bacteria of the tubules where the root has been cut off. If it is not worth while to remove a crown and treat and fill the root canal, the tooth should be extracted or there will be recurrence with or without symptoms and the patient is as badly off as before.—KURT H. THOMA, *Dental Items of Interest.*

The Banded Crown.—As to the conservation of the soft tissues, let me say that I have practically no place for the banded crown. Its application usually results in irritation to the soft tissues which precedes so disastrous a series of conditions. My practice has been to excise the crowns, trim the tooth to the gum line, except at the lingual, where it may be left high. The enamel is removed, and the bevel obtained in so doing is accentuated to an angle varying with the degree of stress to which the root is to be subjected. This develops on the root surface a well defined angle margin such as we would develop in a cavity. To this margin the coping of thin platinum, swaged over a model of the root, is burnished and we have a lap joint. This, in my hands, has settled the question of injury to the soft tissues.—KARL G. KNOCHE, *Dental Items of Interest.*

Influence of Sterility During Canal Treatments.—In countless teeth opened, not because of actual apical disease, but on account of poor root canal fillings which needed clinical investigation to substantiate periapical conditions, we have found fibers of live tissue at the apex in teeth which have been filled for years. What conclusion can we draw from this? It almost makes one believe, and I must say that I am inclined to this belief myself, that sterility and asepsis prior to filling and during it, are more important than complete filling to or through the apex. With our present knowledge of multiple canals and their minuteness, this becomes a vital subject for consideration.—E. J. EISEN, D.D.S., and R. H. IVY, M.D., *Dental Items of Interest.*

A Physician's Opinion.—Teeth which cannot be filled and cause continuous trouble or pain should be extracted, but every ailment of the human body, from headache to gallstones, cannot be explained by the teeth, and these should not be taken out because erroneously they are considered the fons et origo of morbid symptoms.—BEVERLEY ROBINSON, M. D., *N. Y. Medical Journal.*

Points of Interest Concerning Pyorrhea.—First: Riggs' Disease results primarily from degenerative changes in the investing structures of the teeth. Second: Irritation, as the important secondary cause, would

not, with normal vital resistance, result in destruction, but would lead to reaction and repair. Third: The primary cause is the result of inadequate nutrition—regional debility of the deeper structures. Changes in the gingivae are merely symptomatic. Fourth: In induced hyperemia we have a therapeutic agent of great value. Fifth: Scaling is more easily performed, less in extent, and safer to patient, if done after the parts are cleansed and revitalized than before.—M. H. CAZIER, M.D., *Dental Cosmos*.

The Violet Ray.—The value of the violet ray in reducing a swelling lies in the fact that the molecular bombardment of the tissues produced by the rapid oscillations of the high-frequency generator increases the bodily heat without an increase in bodily temperature. Heat is stimulated by the increased production of oxygen in the form of ozone, and by the increased force and volume of the electrical content of muscle tissue. The violet ray thus loosens mechanically and chemically molecular energy, has a highly energizing effect locally and produces an increased tonicity of the part adjacent to the point of application.—W. H. PERRY, *Dental Cosmos*.

Obtunding Sensitive Dentin.—A crystal of carbolic acid placed in the cavity of a sensitive tooth and the high frequency current applied, effectually obtunds the sensitive dentin sufficiently for the operator to excavate the cavity.—W. H. PERRY, *Dental Cosmos*.

Something New in Plate Repair.—To replace a broken bicuspid, select a porcelain crown to fit the case, and with an engine bur fit a seat for the crown. Now, with a drill, make a hole running up into the rubber on the buccal position of the plate, bend the post to fit; and cement in place. Most plates are thick enough for this kind of repair of all teeth but the molars. Molars can be repaired by using the diatoric teeth, seating the same as above, and using small nickel-plated woodscrews, which can be bought at any hardware store, as posts.—G. B. SPEER, *Dental Summary*.

A Hint about Dental Bridges.—If a dental bridge is attached to a solid fixed anchorage at one end, and has a loosened tooth or root for anchorage at the other, it will be a short-lived bridge. The fact that it is movable at one end makes a lever of such a bridge, and the force of mastication, being the power applied, will tear the solid fixed end loose from its anchorage, or loosen the root or break the bridge. A firm fixed anchorage at one end of a bridge will not sustain and hold firm the opposite end if the anchorage of said opposite end is loosened in the outset, or becomes loosened after the bridge has been in use. If the anchorage for one end of a bridge is not firm, the anchorage for the opposite end should be correspondingly movable. If the anchorage for either end of a bridge is not firmly fixed it would be better to choose some other method for restoring or supplying the lost teeth.—H. A. CROSS, *Dental Review*.

Management of Cervical Cavities.—In dealing with cavities

beneath the gum margin on buccal or labial surfaces, the cavity should be cleansed of decay as far as possible by hand. A ligature is then passed around the neck of the tooth, the free ends lying loose. The cavity is protected from moisture with cotton rolls, and dried thoroughly with warm air blasts. The gum is then pressed out of the cavity with balls of cotton, using larger and larger pieces, until in a few minutes the gum stands away from the cavity. The cavity is then packed with temporary stopping and quickly tied in place with the silk ligature. The silk should not be the silk used for cleansing teeth as that stretches when wet. Tie with silk used by orthodontists as that contracts and therefore tightens. Before the temporary stopping has hardened, with a warm ball burnisher, gently force the stopping well up and under the gum.—From *Around the Table, Dental Items of Interest*.

Guarding the Integrity of the Gingivae.—A condition that must be guarded against is injury to the attachment of the gingiva at the gingival line by the improper use of ligatures; the placing and the maintaining of a rubber dam in position for a considerable time without previously cleansing the field of application; the neglecting to remove salivary or serumal calculus; the improper use of scalers in such removal whereby the operator's ignorance of the location of the gingival line results in his severing the attachment of the periodontal fibres at that point; any use of finishing instruments, disks or strips that injures the gingiva; and finally, the extending of the gingival wall of a cavity beyond the gingival line as is very likely to be the case where the gingival wall is made concave from the occlusal as is done in round bottomed cavities.—H. E. FRIESELL, *The Journal of the N. D. A.*

Value of Prevention.—If we can maintain the health of the gingiva, and control caries so that it does not reach the pulp, we can prevent pyorrhea and alveolar abscesses, and thus remove the possibility of those two prevalent seats of focal infection. When dentistry, with the aid of the patient has accomplished this, we will have taken "the next great step in preventative medicine."—H. E. FRIESELL, *The Journal of the N. D. A.*

Beginning of Pyorrhea.—The gingival tissue consisting of a mucosa and a submucosa, has very narrow blood vessels; under normal conditions it is firmly attached to the alveolar process and to the teeth. The pushing forward of a foreign body, like calculus, beneath the gum tissue, has a direct effect on the circulation. If it is hard, it will act mechanically, if soft and acid, as a chemical injury. The mechanical irritation from calculus results in constriction of the normally narrow blood vessels; the elasticity of the vessel wall is lessened and finally destroyed. The result is stasis in the vessels, followed by transudation of blood serum, and exudation. Blood serum, however, as we know, is the best culture medium for microorganisms.—F. B. NOYES, *The Journal of the N. D. A.*

Amalgam as a Tooth Saver.—Higher regard for amalgam as a tooth saver has stimulated greater care and study in cavity preparation. True also is the statement that as greater attention to detail is given tooth preparation, by just so much has that amalgam filling better opportunity to render long and satisfactory service.—*Dental Quarterly*.

Condensing Amalgam.—Packing or condensing instruments need not be of great variety. It is a decided mistake to have the plugger point of excessive area. Amalgam cannot be condensed and adapted, particularly to approximal margins, except with small points having only fine serrations. For filling in the center and bulky portions of the filling, and particularly condensation of the final additions, nothing equals a large smooth-end tantalum instrument. It "glides over" the amalgam with not the slightest tendency to "draw." There is a marked difference in working qualities between such a tantalum-point instrument and even the most highly polished nickel-plated steel one.—*Dental Quarterly*.

Mixing Oxyphosphate of Zinc Cements.—The proper procedure to be followed is to mix the cement by adding the powder to the liquid in small portions at a time. Thorough spatulation between successive additions of powder is essential. Setting should be controlled by adjusting the temperature of the slab. A warm slab will hasten setting and a cold slab will retard it. The cement should be mixed as thick as consistent with the requirements of a given operation. It should not be mixed too thin and allowed to thicken up for use. The mixing of a dental cement is a chemical operation in which rate of addition of powder to liquid, thorough mixing, and control of temperature are important factors.—*Dental Quarterly*.

Dental Defects in Recruits.—The third important cause for non-acceptance is defective teeth, which forms twenty-seven per cent of all rejections. In this number are considered teeth that had been neglected beyond any possibility of repair. The minimum requirement is twenty sound teeth, of which there must be four opposing molars and four opposing incisors, with crown and bridge work counting as sound—a fair minimum, indeed! We are here reminded that in fifty-eight per cent. of the total number of school children examined were defective teeth found, and who can deny that if these defects had been corrected during the school age many healthy citizens and acceptable recruits would have been saved for the nation? The author's surmise that defective teeth and defective vision frequently go together is fully in accord with the modern conception of focal infection, and should serve as a still further incentive for an early correction of dental defects.—*Editorial, N. Y. Medical Journal*.

OUR ARMY AND NAVY

LODGE AMENDMENT TO HOUSE BILL 4897

[The import of the Lodge Amendment to H. R. 4897, now before the Senate, is given clearly in the following excerpt from a letter from Dr. Homer C. Brown, Chairman, Legislative Committee, National Dental Association.]

. . . It may be interesting to know at this time that at the time our Army legislation, as passed by the Senate and House last year, was pending in the Conference Committee, we prepared a substitute, along lines developed in the discussion when the Pomerene amendment was before the Senate for consideration. At that time a number of Senators expressed themselves as willing to give the Dental Corps the same status as the Medical Corps. However, under the limitation of the action of the Senate and House we necessarily limited our grades in the proposed substitute, to that of Major, as that was the highest grade which had been granted by either branch of Congress. This substitute was not accepted, but it may be said that the following amendment by Senator Lodge, introduced July 3rd, is more or less the direct result of that proposition:

"Intended to be proposed by Mr. Lodge, to the bill (H. R. 4897) to amend section ten of the National Defense Act, approved June third, nineteen hundred sixteen, and for other purposes," as follows:

"Hereafter the Dental Corps shall consist of commissioned officers of the same grades and proportionally distributed among such grades as are now or may hereafter be provided by law for the Medical Corps, who shall have the rank, pay and allowances of the officers of corresponding grades in the Medical Corps, including the right to retirement as in the case of other officers, and there shall be one dental officer for every one thousand of the total strength of the Regular Army, authorized from time to time by law:

PROVIDED, That all laws relating to the examination of officers of the Medical Corps for promotion shall be applicable to officers of the Dental Corps:

PROVIDED FURTHER, That Dental Examining and Review Boards shall consist of one officer of the Medical Corps and two officers of the Dental Corps:

AND PROVIDED FURTHER, That immediately following the approval of this act, all Dental Surgeons then in active service shall be recommissioned in the Dental Corps in the grades herein authorized in the

order of their seniority and without loss of relative rank in the Army:

AND PROVIDED FURTHER: That First Lieutenants in the Medical Department shall be promoted to the grade of captain upon the completion of three years' service in that grade in the Medical Department and upon passing the examinations prescribed by the President for promotion."

In order that the connection between the Lodge Amendment and H. R. 4897 may be fully understood, the latter is herewith incorporated: "PROVIDED, That during the existing emergency, Lieutenants in the Medical Corps of the Regular Army and of the National Guard shall be eligible to promotion as captain upon such examination as may be prescribed by the Secretary of War." . . . This proposed legislation will automatically give three grades to the Dental Reserve Corps members, that is, First Lieutenants, Captains and Majors.

The needs of the war will call many of our members into the Reserve Corps and you are undoubtedly interested in doing your part both in rendering service and cooperating in promoting this legislation. In order for this cooperation to be effective, prompt action will be necessary.

You can very positively assist in this legislation by writing immediately, or more preferably using night letter telegrams, to your Senators respectfully soliciting their support of the Lodge Amendment to House Bill 4897 and request them to see Senator Chamberlain and other members of his Committee in behalf of the Lodge Amendment.

* * *

PREPAREDNESS LEAGUE OF AMERICAN DENTISTS

BY J. W. BEACH, D.D.S.

The Preparedness League of American Dentists has become the medium through which the dental profession at large is carrying on the work of preparation for the great service that is ahead of it. For a year and a half this organization has been putting forth every effort to awaken our profession to the realization of the situation, and had it not been for the increasing labor of the organizers of the League, surely we would have found ourselves in a deplorable state of unpreparedness when the stirring message that "War is upon us" was sounded from coast to coast.

The League has nearly 6000 active members and more than 125 sectional Units in active operation. Study courses are planned for these Units and several lectures with slides are furnished free of charge. This has proven a most effective means of preparing hundreds of our members for the entrance examinations to the Officers' Reserve Corps, Dental Section. We are gratified to report satisfactory progress in securing a splendid Dental Reserve for our Government and we predict the establishment of the most efficient service in this important department of any nation.

Caring for the mouths of applicants for enlistment who are unable to pay for dental service is a most important object of the League and

we wish to take this opportunity to thank our members for the unparalleled response this phase of our work has received. We are proud of our profession, and when the final reckoning shall come, it will be shown that we have saved for our country many thousands of fighters. The League has been designated the official medium for prosecuting this work and members are requested to report to our headquarters all cases thus cared for, so that we may compile statistics to present to the Surgeon-General. The Government appreciates what we are doing and we believe our efforts will not go unrewarded when future favorable legislation may be desired by us.

We hope to bring many new members into the National Dental Association through the League, and would call the attention of the Officers of our Units to this matter. We should bring many into the National before the annual meeting in October next.

The second annual meeting of the League will be held in conjunction with the N. D. A. on October 23, 1917, in Concert Hall, Hotel Astor, New York. We are planning a splendid program and will be able to report wonderful results from the different Units. Several dental ambulances for use in France are being supplied by our Units and other equally patriotic movements are under way.

We urge the formation of Units more generally in order to promote the various objects of the League. Organization is essential and we would point out that *now* is the time our best efforts are demanded, as the League is organized as a war measure, therefore we invite correspondence with this object in view. Headquarters are at 131 Allen St., Buffalo, N. Y.

* * *

THE PREPARATION OF THE MOUTH OF APPLICANTS FOR ENLISTMENT

This is without doubt the most important service the Preparedness League of American Dentists can, at this time, render our Government. We request all members when possible to fulfill this duty in a most conscientious manner. We are proud of the work our profession thus far has done in a most generous and unselfish spirit.

The applicant should not receive our gratuitous service until he has been rejected by the Army examining officer because of defective teeth alone.

SUGGESTIONS

1. See that the applicant is worthy and unable to pay for dental service.

2. He should be accompanied by a non-commissioned officer from the recruiting station to the dentist, bearing a letter written on war department stationery, signed by the examining officer in charge of the recruiting station. When completed, especial care should be observed to return him to the recruiting station to complete his enlistment.

3. When unaccompanied, the League suggests that the applicant sign his name on the letter furnished by the examining officer, which signature should be duplicated upon his arrival at the dentist. This will obviate the possibility of transferring the privilege to another person.

Our service has to do with the applicant before enlistment and not with the recruit who has taken the federal oath. Such cases are for the Government to take care of, because it cannot accept gratuitous service. We thereby will create a greater need of an adequate corps of Army Dental Surgeons.

PROCEDURE

1. The committee in charge should always be members of the League. A canvass, either personal or by mail, should be made among the dentists within the territory of the recruiting station to determine the time and number of hours which each dentist will give for this purpose. All applicants may then be referred in regular order to the League members for service.

A feasible and successful plan may be followed by arranging with the recruiting officers for a dentist to visit said station for a half hour on one, two or three days each week as conditions may require, when all dental defectives may be examined, charted and assigned to volunteer dental surgeons for treatment.

2. In some instances, a room in close proximity to the recruiting station has been equipped for service, thereby obviating several features mentioned in above suggestions.

Public dental clinics, such as dental colleges, free city dispensaries, as well as private offices, are, in many localities, being utilized for this purpose.

These problems must be met as indicated by the varied needs and conditions presenting themselves in different sections. •

DENTAL REQUIREMENTS

A clean mouth never produces disease. The most essential requirement is to make the mouth hygienic.

DENTAL REQUIREMENTS FOR APPLICANTS FOR ENLISTMENT TO THE ARMY

Four molars or bicuspsids on one side and so opposed as to serve the purpose of mastication, will admit an applicant to the Army or Militia, provided there is absence of all disease producing conditions, such as broken down or abscessed teeth and roots, acute pyorrhea or infectious conditions of the mucous membrane of the mouth, etc.

Bridge work and properly filled teeth count as sound teeth. Partial dentures may be accepted, provided the above requirements are present, but full dentures are not permitted.

DENTAL REQUIREMENTS FOR ENLISTMENT TO THE NAVY

Twenty sound teeth.

Four opposing incisors.

Four opposing molars.

Bridge work and properly filled teeth count as sound teeth.

True pyorrhea is cause for rejection.

Full and partial dentures are rejected by the navy.

In regard to this work we recommend—

1. That only enough dental service be rendered to enable applicant to enlist.

2. That fillings be limited to cements and amalgam.

3. That no plate work be undertaken, as the enlisted man can so easily break or throw it away, thus claiming disability.

* * *

[Letter to Members of the League]

MY DEAR DOCTOR:

The officers of the Preparedness League take great pleasure in extending to you the thanks of Major General John F. O'Ryan for the work which you have done in caring for the mouths of the men of the N. G., S. N. Y. This is a great work and we should all feel happy and proud in having had a part in it.

Very truly yours,

(Signed) LELAND BARRETT,
Secretary Metropolitan Unit
J. K. POWELL, JR.,
Secretary Brooklyn Unit

HEADQUARTERS DIVISION
NATIONAL GUARD, NEW YORK
MUNICIPAL BUILDING
NEW YORK CITY

July 18, 1917.

DR. J. W. BEACH,

President Preparedness League of American Dentists,
131 Allen Street,
Buffalo, N. Y.

SIR:

I am in receipt of the report of First Lieutenant Bissell B. Palmer, Jr., Dental Corps, covering the work performed by the dental profession of this State under the supervision of the Preparedness League of American Dentists, in furtherance of our desire to have the teeth of soldiers of the New York Division in proper condition for field service. What has been accomplished through the practical patriotism of the dental profession is truly remarkable, and is quite beyond anything expected. The report shows that the teeth of 17,005 men of this division were examined by members of the dental profession; that 10,032 teeth were extracted and 8,685 teeth filled. All this professional service and the materials used were

furnished without expense to the State or Government, and they constitute a most valuable and substantial contribution to the cause.

Will you be good enough to make known in some way to those who have contributed to the above accomplishment, the appreciation and thanks of the officers and men of the New York Division.

Very respectfully,

(Signed) JOHN F. O'RYAN,
Major General.

* * *

[The following letter should appeal to all dentists not officially in the service of their country at this time.]

August 1, 1917.

DEAR DOCTOR:

The Preparedness League of American Dentists, represented by the Metropolitan Unit, has within the space of four weeks, examined the mouths of 15,040 soldiers; they have inserted 7,407 fillings, and performed 8,611 extractions. This work has been done by 450 dentists. We are now endeavoring to raise money for the purpose of purchasing and fitting out a number of dental ambulances to go to the front with our troops. The Executive Committee of the Preparedness League has been in conference with some of the men who have seen service in the Dental Corps at the front and we are assured of the very imperative need for these ambulances.

This letter is being sent to the dentists in Greater New York to ask that every man will give a contribution of \$5.00 for this purpose. We have already received some contributions from dentists, ranging from \$5.00 to \$100.00, but these contributions have all come from the men who have also been engaged in the work of examining recruits and filling teeth. This is, no doubt, a natural sequence, as the men who come closest in touch with these conditions realize their importance, and naturally take a greater interest than those who do not. But we feel sure that every patriotic American dentist in Greater New York will be willing to contribute at least \$5.00 to help provide these ambulances, especially if he has not had the opportunity to give volunteer service to the troops. We would like to feel that there are no slackers in our profession in Greater New York, and it would be a wonderful showing to the country if it was known that practically every dentist in the city had contributed at least \$5.00 to help take care of the mouths of our troops at the front.

Make your check and forward it at once to Waldo H. Mork, treasurer, 1882 Grand Concourse, Bronx, N. Y. City, who will send official acknowledgment.

CHAS. F. ASH,
Chairman, Executive Committee
Metropolitan Unit.

[Every member of the League will read this letter from the man in the ranks with pleasure and personal satisfaction.]

June 26, 1917.

THE DENTISTS PREPAREDNESS LEAGUE,
17 West 43rd St., New York.

DEAR COMRADES:

Permit me to address you as such, for after all we are all comrades, for it does not make any difference whether we do the actual fighting or not, we are all striving to give the best that is in us to a very noble cause.

I cannot say too much in the way of thanks to your kind committee and to your wonderful organization of dentists, who so patriotically give their services and materials to make the men more fit for their duty to Uncle Sam.

I was sent by your kind committee to Dr. ———, of ——— St., where I received the most courteous and efficient treatment. I could not have been better had I paid fifty dollars to have my teeth treated. Thanking you again for making this very good thing possible, and great thanks to Dr. ———, I am,

Very respectfully,

JOHN F. WETZEL,
Private, Battery "F."
2nd New York Field Artillery.

[We are indebted to the ARMY AND NAVY JOURNAL for the following items.]

NEW ASSISTANT DENTAL SURGEONS, U.S.N.

Fifteen of the thirty-three applicants who entered the examinations held July 16-25 for appointment as assistant dental surgeons in the Navy Medical Corps were successful, and will be recommended for appointment. They are as follows:

Harold A. Daniels, Paris Island, S. C.
Robert S. Davis, Meriden, Conn.
Herbert F. Delmore, Wausau, Wis.
Eugene D. Jarbock, Poolesville, Wis.
Frank Kaufman, Gouverneur Hospital, New York City.
Louis B. Lippman, 1287 Franklin Avenue, New York.
Robert S. Maxwell, Metro Building, Denver, Colo.
Philip S. McGann, 140 Highland Avenue, Somerville, Mass.
James I. Root, 409 Southern Building, Washington, D. C.
Kemper K. Weaver, New Lebanon, Ohio.
Paul W. Yeisley, T-R Building, Uniontown, Pa.
Joseph A. Tartre, 39 Congress Street, Portsmouth, N. H.
Charles C. Tinsley, 73 Courtland Avenue, Macon, Ga.
Merrill G. Severson, 1303 Penn Avenue, N. Minneapolis
Alvin B. Ward, 1316 Wells Street, Milwaukee.

NAVY NOMINATIONS.

Nominations received by the Senate, July 20, 1917.

PROMOTIONS AND APPOINTMENTS IN THE NAVY.

Med. Inspr. George T. Smith: med. director., May 23, 1917.

Med. Inspr. George A. Lung: med. director, July 1, 1917.

Julius F. Neuberger, Asst. Surg., M.R.C., Navy: assistant surgeon in Navy from July 7, 1917.

Citizens to be dental surgeons, probationary, two years, from July 3, 1917: Louis F. Snyder, S. D.; James C. Lough, Cal.; Glen S. Phillips, Pa.; John E.

Herlhy, Mass.; George C. Fowler, D. C.; Guy E. Nicholas, Me.; Travis F. Epes, Va.; Sidney M. Akerstrom, Mass.; Francis S. Weir, Wash.; Jerold M. Siegel, Mich.; Russell A. Henry, Pa.; Lindsay H. Brown, Ore.; Charles C. Bockey, D. C.; Leon C. Frost, Ohio; Deane L. Chamberlain, Colo.; Errol W. Willett, Ore.; Clark E. Morrow, Mo.; Louis M. Benepe, Minn.; William R. Taylor, Minn.; Anthony A. Norkiewicz, Pa., and Robert Van Patton, Pa.

Lou C. Montgomery, a pharmacist's mate, second class, to be dental surgeon, probationary, two years, from July 5, 1917.

WEARING THE UNIFORM.

Anent the wearing of uniforms by Army and Navy officers, now that this country is at war with Germany, an officer of the Navy, in a letter written before Secretary Daniels issued his general order of June 30 requiring all officers and enlisted men of the Navy to don their uniforms at all times on and after July 4, "except when excused by proper authority," says: "All officers of the Army and Navy should be required to wear their uniforms at all times while a state of war exists. There are numerous good reasons why this should be ordered by the Commander-in-Chief of the Army and Navy, and none of any consequence that can be advanced against it. The following have been my principal personal reasons for not wishing to appear in uniform at all times—the conspicuity of the wearer due to a general ignorance of what the uniform is, on the part of the public, and being mistaken for street car conductors, a member of some secret society or some other such body entirely foreign to the Service. As a general rule, military and naval officers are not desirous of being the cynosure of all eyes, and especially since the uniforms of the two Services have in recent years been shown so little respect by the public.

"The uniform should now be worn by all who are entitled to wear it at all times during the continuance of the present war. In other words, civilian clothes should be absolutely barred in both Services during war time, if not altogether. The wearing of the uniform will teach the public to recognize and respect the uniform and also the man who wears it as a defender of his country. From a purely selfish standpoint, if all were required to wear the uniform and not permitted to wear civilian clothes, it would save one from having to keep on hand a supply of civilian clothes which is now quite an item with the increasing high cost of living. Most civilian salaries will increase to meet the H. C. L., but there is not much chance of Army and Navy officers' salaries increasing for this reason, as their salaries are fixed by Congress and have been increased only once in the last seventy-five years. This generation and the next will probably have passed away before another increase is made, if it ever will be. As an officer in my country's Service I am proud of it and my uniform, and would be glad to show my colors publicly at all times, but will not make myself conspicuous by wearing my uniform at all times, unless all others do the same."

MILITARY APPEARANCE AND COURTESY.

BULLETIN 51, JUNE 20, 1917, SOUTHEASTERN DEPT.

1. The attention of all officers in this department is invited to the requirements of Orders and Regulations in reference to the standard required from officers in respect to military appearance, correctness of uniform, punctilioussness in saluting, etc. Their attention is especially invited to the example to be set by their personal compliance with the recently enacted laws designed to protect the uniform from degrading influence. It is only by the strictest compliance on the part of officers that, by their example, they may properly insist upon like observance from enlisted men.

2. In the matter of saluting, officers will be held personally responsible that enlisted men render them the prescribed salute. This will be undertaken as a matter of instruction with the recruit who is unused to military observances, but in no case where the salute is required will this neglect be overlooked. All officers will require from their subordinates neatness of appearance, propriety of conduct in public, and the correct observance of military courtesy; where corrections cannot be made in person, the officer who observes any neglect in this respect will report the matter to the offender's immediate commanding officer for disciplinary action.

3. Enlisted men having authority to leave the limits of a military reservation on pass or furlough will be inspected by an officer or non-commissioned officer to see that all articles of uniform are clean and neat and shoes polished; enlisted men going on furlough or pass or who are detailed on special duty in cities may wear a white collar or stock and white cuffs, in lieu of the olive drab shirt.

By command of Major General Wood:

C. E. KILBOURNE, Major, Gen. Staff, Chief of Staff.

BAGGAGE FOR EXPEDITIONARY FORCES.

Instructions have been issued by the War Department to department commanders of the Army, that until further orders troops designated for duty with the expeditionary forces in Europe may take with them to the port of debarkation the following personal baggage: (a) Each officer above the grade of captain the field allowance given in Par. 136, Army Regulations. This allowance shall include equipment C, professional books and all necessary clothing and bedding for extended field service.

(b) Each officer below the grade of major and each contract surgeon, acting dental surgeon and veterinarian 350 pounds. This allowance shall include equipment C (exclusive of horse equipment), professional books and all necessary clothing and bedding for extended field service.

(c) Each non-commissioned officer of and above the grade of color sergeant and each civilian employee of the classified service such clothing and personal effects as can be contained in one trunk locker or other container of equivalent capacity and not exceeding 150 pounds in weight. This allowance shall be in addition to equipment C and shall include, with equipment C, all necessary clothing and bedding for extended field service.

(d) Each enlisted man below the grade of color sergeant and each civilian employee not in the classified service such clothing and personal effects as can be contained in one barrack bag and not exceeding seventy-five pounds in weight. This allowance shall be in addition to equipment C and shall include, with equipment C, all necessary clothing and bedding for extended field service. Containers for personal baggage shall be as follows:

(a) For officers, contract surgeons, acting dental surgeons and veterinarians the standard trunk lockers and bedding rolls or their equivalent in similar containers. (b) For non-commissioned officers of and above the grade of color sergeant and for civilian employees of the classified service the standard trunk locker or its equivalent. (c) For enlisted men below the grade of color sergeant and for civilian employees not in the classified service the standard barrack bag or its equivalent.

A new card that is now appearing on many houses throughout the United States has been prepared for distribution by the U. S. Marines. It has been designed to replace cards, formerly distributed by that organization, that read: "A man from this house is serving in the United States Marine Corps." The new announcement, printed in white and blue letters on a fac-simile of the French tricolor, bears the simple but more impressive legend: "A man from this house is fighting in France with United States Marines."

What to send to soldiers in service in France for their personal use is thus summed up by a correspondent of the New York *Evening Post* who was at the front when he wrote the letter from which we quote. "I suggest," he says, "a thing or two to give to troops. I know I have found most useful a safety razor that can be sharpened, and a trench glass, made of polished steel, measuring about four and one-half inches, so that it is small enough to fit in one's tunic pockets. Next a tin (or, better still, aluminum) soap dish—my soap, put into my pack, used to spread itself in lavish quantities all over my kit. I was in despair until I succeeded in having a soap dish sent to me. (The edges and corners, by the way, should be round.) And carbolio soap is best. When you have to wash in a little bit of water in which twenty or thirty men have washed you will appreciate the peculiar qualities of carbolio soap.) English troops smoke Virginia cigarettes, Turkish or Egyptian tobacco is not procurable. The French smoke a horrible fag, and the result is that our troops have their cigarettes sent from home to supplement those issued by the army. . . . By the way, add to the list of a soldier's necessities a box of something that will frighten away the uninvited guests who come to the lodgings with us. One can't escape them." To this excellent advice we would add: Do your "trench" shopping" early and often!

RESERVE CORPS ORDERS.

DENTAL RESERVE CORPS.

First Lieut. Charles F. Pickering, D.R.C., to active duty at Gettysburg, Pa. (June 26, War D.)

First Lieut. Clifton E. Donnell, D.R.C., to duty at Fort Benjamin Harrison. (June 26, War D.)

First Lieut. Frederick F. Mensching, D.R.C., to duty at Syracuse, N. Y. (June 26, War D.)

First Lieut. James J. Nelson, Jr., D.R.C., to duty at Gettysburg, Pa. (June 26, War D.)

First Lieut. Harvey E. Stahl, D.R.C., to duty at Philadelphia. (June 27, War D.)

First Lieut. Louis A. Landy, D.R.C., to duty at Madison Barracks, N. Y. (June 26, War D.)

Officers of D.R.C. to active duty at Fort Oglethorpe: First Lieuts. John M. McCausland and William L. Nance. (June 26, War D.)

Officers of D.R.C. to duty at Fort Riley: First Lieuts. Fred A. Beatty and Wallace C. Sechrest. (June 26, War D.)

First Lieut. John L. Schock, D.C., to Fort Banks, Mass., for temporary duty. (June 13, War D.)

First Lieut. George D. Graham, D.C., from El Paso to Fort Sam Houston, for temporary duty. May 31, S.D.)

First Lieut. Samuel H. Leslie, D.C., from Brownsville, Tex., to aviation camp (south), San Antonio, for temporary duty. (May 31, S.D.)

First Lieut. Robert H. Mills, D.C., from Brownsville to Camp Funston, Leon Springs, Tex., for temporary duty. (May 31, S.D.)

First Lieut. Richard K. Thompson, D.R.C., to Washington Barracks for duty with 1st Engineers. (June 15, War D.)

First Lieut. F. E. Hendrickson, D.O.R.C., to Fort Constitution, N. H., for duty. (July 12, N.E.D.)

First Lieut. Charles F. MacDonald, Jr., Dental R.C., to duty Washington. (July 11, War D.)

First Lieut. Weston B. Estes, Dental R.C., to duty Fort Totten, N. Y. (July 11, War D.)

First Lieut. H. J. Kewser, Dental R.C., to duty Gettysburg, Pa. (July 11, War D.)

Stephen T. Bird, Dental R.C., to Washington, duty with 6th Engineers. (July 12, War D.)

First lieutenants, Dental R.C., to report by telegraph to commanding general, Southern Dept., for duty: J. L. Brown, J. A. Johnson, C. M. Meares, H. M. Nolan, J. E. O'Flinn, J. H. O'Reilly, G. E. Sandoz, V. F. Schoppe, W. A. Spence and C. E. Wisecup. (July 12, War D.)

First Lieut. Ira J. Kall, D.R.C., to duty at Fort Myer. (July 11, War D.)

Officers, D.R.C., to duty at Fort Riley: First Lieuts. R. O. Dickson, T. D. Grannick and F. W. Wyatt. (July 18, War D.)

First Lieut. George G. Starke, D.R.C., to duty at Fort Oglethorpe, July 31, (July 20, War D.)

First lieutenants of D.R.C. to duty as follows: A. P. Dixon to Fort Myer; John T. Ashton to Fort Oglethorpe. (July 19, War D.)

First lieutenants of D.R.C. to duty as follows: C. L. Sandiford to Fort Ethan Allen, Vt.; C. V. B. Beard, J. T. Conner and J. H. Stewart to Fort McPherson; J. F. Ackley, J. M. Ackley, J. P. Collins, H. R. Dinger, C. J. Gray and C. J. Murphy to San Francisco. (July 20, War D.)

First lieutenants of D.R.C. to duty as follows: James A. Campbell to San Diego, Cal.; Jacob H. Leff and Leonard J. Heinman to Canal Zone. (July 21, War D.)

First Lieut. Howard I. Benedict, D.C., to station at Fort Screven. (July 18, War D.)

First Lieut. E. C. Ailey, D.R.C., to Gettysburg, Pa., for duty. (Aug. 3, War D.)

First Lieut. Harry E. Bouden, D.R.C., to duty at Fort Des Moines, Iowa. (Aug. 3, War D.)

First Lieut. J. Reid Hogan, D.R.C., to Plattsburgh Bks. for duty. (Aug. 3, War D.)

First Lieut. H. D. Kemper, D.R.C., to duty at Fort Oglethorpe, Ga. (July 28, War D.)

First Lieut. Robert L. Eller, D.R.C., to duty with 10th Engrs., American University, Washington. (July 30, War D.)

First Lieut. George J. Sibley, D.R.C., to duty in Washington. (July 30, War D.)

First Lieut. H. M. Nolan, D.R.C., Fort Sam Houston, to Camp Funston, Leon Springs, Tex., for duty. (July 17, S.D.)

First Lieut. Gerald F. Stoodly, D.R.C., to School of Military Aeronautics, Berkeley, Cal., for duty. (July 27, Western D.)

First Lieuts. John E. O'Flynn and Joseph L. Brown, D.R.C., Fort Sam Houston, to Camp Kelly, South San Antonio, Tex., for duty. (July 17, S.D.)

"Wasn't it of Kitchener's troops that the Kaiser spoke as a contemptible little army?" says the Canadian Military Gazette. "Well, he has found it not so worthy of disparagement as he supposed. Now he has another contemptible army to deal with. He has seen fit to sneer at the United States soldiery. Hundreds of them are visiting Toronto daily from Fort Niagara, and a contemporary in that city rises to remark that if they are average specimens the Kaiser will have to revise his opinion of them after the first encounter."

OFFICERS' RESERVE CORPS.

The Adjutant General's Office, War Department, has announced the lists that follow of persons whose acceptances of appointment in the Officers' Reserve Corps have been received:

Note.—Rank, arm of Service, number indicating order of appointment, place of residence and date of acceptance of appointment (year 1917), follow name of the appointee. Addresses as given here omit street address.

Wheeler, Herbert L., 1st Lieut., Dental, 11, New York, May 8.
 Sykes, William S., 1st Lieut., Dental, 10, Washington, May 8.
 Peters, John L., 1st Lieut., Dental, 48, New York City, May 28.
 McCausland, J. McG., 1st Lieut., Dental, 49, Washington, May 28.
 Thompson, Richard K., 1st Lieut., Dental, 56, Washington, June 1.
 Starr, Robert W., jr., 1st Lieut., Dental, 59, Philadelphia, June 1.
 Eggleton, W. J., 1st Lieut., Dental, 61, Germantown, Pa., June 1.
 Nesbit, B. S., 1st Lieut., Dental, 64, Northumberland, Pa., June 1.
 Estes, Weston B., 1st Lieut., Dental, 69, New York City, June 1.
 Mensching, F. F., 1st Lieut., Dental, 70, New York City, June 1.
 Stahl, Harvey E., 1st Lieut., Dental, 74, New York City, June 1.
 Smith, David S., 1st Lieut., Dental, 62, Philadelphia, June 1.
 Senecal, A. L., 1st Lieut., Dental, 105, Plattsburg, N. Y., June 25.
 Nones, R. H., jr., 1st Lieut., Dental, 113, Philadelphia, June 25.
 Curry, John H., 1st Lieut., Dental, 135, Woodbury, N. J., June 25.
 MacDonald, C. F., 1st Lieut., Dental, 152, New York City, June 25.
 Bauer, William C., 1st Lieut., Dental, 165, Brooklyn, June 25.
 Saunders, E. E., 1st Lieut., Dental, 202, Westfield, N. J., June 25.
 Greenstein, M., 1st Lieut., Dental, 226, Wilmington, Del., June 25.
 Lewis, Clifford E., 1st Lieut., Dental, 72, Shelton, Conn., June 1.
 Millard, Joseph J., 1st Lieut., Dental, 73, Norwalk, Conn., June 1.
 Gullifer, Wm. H., 1st Lieut., Dental, 93, Belmont, Mass., June 16.
 Sherburne, W. H., 1st Lieut., Dental, 94, Woburn, Mass., June 16.
 Wilen, Charles H., 1st Lieut., Dental, 75, Bronx, N. Y., June 1.
 Ennis, Leroy M., 1st Lieut., Dental, 85, Philadelphia, June 1.
 Cloutier, G. A., jr., 1st Lieut., Dental, 179, Augusta, Me., June 25.
 Tannebring, C. H., 1st Lieut., Dental, 195, Beverly, Mass., June 25.
 Gregory, H. L., 1st Lieut., Dental, 225, Pittsfield, Mass., June 25.
 Richardson, Walter H., 1st Lieut., Dental, 77, Worcester, June 1.
 Cheney, J. E., 1st Lieut., Dental, 180, Fitchburg, Mass., June 25.
 Christman, G., 1st Lieut., Dental, 181, Cambridge, Mass., June 25.
 Winship, F. H., jr., 1st Lieut., Dental, 187, New Bedford, Mass., June 25.
 Webb, E. M., 1st Lieut., Dental, 189, Attleboro, Mass., June 25.
 Putnam, Ralph B., 1st Lieut., Dental, 208, Portland, Me., June 25.
 Peacock, Harold L., 1st Lieut., Dental, 210, Boston, June 25.
 Lafayette, T. E., jr., 1st Lieut., Dental, 214, Watertown, Mass., June 25.
 Keene, S. C., 1st Lieut., Dental, 218, Roslindale, Mass., June 25.
 Day, Frederick W., 1st Lieut., Dental, 275, Gardiner, Me., June 28.
 Donovan, E. J., 1st Lieut., Dental, 280, Wakefield, Mass., June 28.
 Willis, F. A., 1st Lieut., Dental, 287, Manchester, Mass., June 28.
 Baker, E. C., 1st Lieut., Dental, 312, Roslindale, Mass., June 28.
 Lynch, W. F., 1st Lieut., Dental, 405, Somerset, Mass., July 6.
 Charron, Wilbur A., 1st Lieut., Dental, 406, Ware, Mass., July 6.
 O'Keefe, C. S., 1st Lieut., Dental, 408, Taunton, Mass., July 6.
 Cox, James E., 1st Lieut., Dental, 418, Charlestown, Mass., July 6.
 Owen, J. S., 1st Lieut., Dental, 98, Haddonfield, N. J., June 25.
 March, W. H., 1st Lieut., Dental, 107, Jenkintown, Pa., June 25.
 Marshall, J. B., 1st Lieut., Dental, 108, Harrisburg, Pa., June 25.
 Pancoast, A. B., 1st Lieut., Dental, 114, Riverside, N. Y., June 25.
 Pruden, K. C., 1st Lieut., Dental, 116, Paterson, N. J., June 25.
 Schwartz, H. W., 1st Lieut., Dental, 120, New York City, June 25.
 Gluckman, L. D., 1st Lieut., Dental, 139, Wilmington, June 25.
 Gilden, C. T., 1st Lieut., Dental, 141, Philadelphia, June 25.
 Storms, C. L., 1st Lieut., Dental, 153, Buffalo, N. Y., June 25.
 Wright, W. T., 1st Lieut., Dental, 183, Baltimore, Md., June 25.
 Truitt, G. E. P., 1st Lieut., Dental, 192, Baltimore, June 25.
 Staats, G. E., 1st Lieut., Dental, 197, Brooklyn, N. Y., June 25.
 Soverel, F. D., 1st Lieut., Dental, 198, East Orange, N. J., June 25.
 Rossman, L., 1st Lieut., Dental, 204, Baltimore, Md., June 25.
 Reissner, L., 1st Lieut., Dental, 206, Long Branch, N. J., June 25.
 Lahay, W. T., 1st Lieut., Dental, 213, Jersey City, N. J., June 25.
 Jacquin, G. I., 1st Lieut., Dental, 222, South Amboy, N. J., June 25.
 Blarcom, H. V., 1st Lieut., Dental, 232, South River, N. J., June 28.
 Bouden, H. E., 1st Lieut., Dental, 235, Philadelphia, June 28.
 Harrower, F. F., 1st Lieut., Dental, 237, New York City, June 28.
 Flood, J. A., 1st Lieut., Dental, 239, Wilmington, Del., June 28.

Crane, A. R., 1st Lieut., Dental, 242, West Chester, Pa., June 28.
 Loechel, L. O., 1st Lieut., Dental, 244, Elk Lick, Pa., June 28.
 Hogan, J. R., 1st Lieut., Dental, 249, Washington, June 28.
 Fletcher, C. G., 1st Lieut., Dental, 256, Mount Vernon, June 28.
 Brophy, F. H., 1st Lieut., Dental, 264, New York City, June 28.
 Lyon, C. A. L., 1st Lieut., Dental, 265, Asbury Park, June 28.
 Creighton, E. A., 1st Lieut., Dental, 269, Riverside, N. J., June 28.
 Demarest, O. A., 1st Lieut., Dental, 278, New York City, June 28.
 Heckard, W. A., 1st Lieut., Dental, 289, New York City, June 28.
 Barber, H. U., jr., 1st Lieut., Dental, 301, Lake George, N. Y., June 28.
 Barry, A. L., 1st Lieut., Dental, 302, Orange, N. J., June 28.
 Bouton, R. R., 1st Lieut., Dental, 305, Pine Plains, N. Y., June 28.
 Goble, P. S., 1st Lieut., Dental, 311, New Egypt, N. J., June 28.
 Andes, J. F., 1st Lieut., Dental, 316, Rochester, N. Y., June 28.
 Asch, Jacob, 1st Lieut., Dental, 318, New York City, June 28.
 Sibley, G. J., 1st Lieut., Dental, 321, Washington, June 28.
 Solomons, J. R., jr., 1st Lieut., Dental, 339, New York City, July 2.
 Allison, W. J., 1st Lieut., Dental, 343, Hazleton, Pa., July 2.
 Funk, R. C., 1st Lieut., Dental, 354, New York City, July 2.
 Maier, M., 1st Lieut., Dental, 356, New York City, July 3.
 Gaskill, J. H., 1st Lieut., Dental, 387, Philadelphia, Pa., July 5.
 Morrison, J. D. D., 1st Lieut., Dental, 390, Ridgefield Park, N. J., July 6.
 Schmidt, J. E., 1st Lieut., Dental, 394, Brooklyn, N. Y., July 6.
 Denholm, C. J., 1st Lieut., Dental, 435, Pittsburgh, Pa., July 6.
 Dixon, A. P., 1st Lieut., Dental, 439, Cumberland, Md., July 6.

MAIL FOR OUR FORCES ABROAD.

Further data received from the Post Office Department as to mail for our Army and Navy on service abroad is as follows:

Mail addressed to members of the Expeditionary Forces should bear the complete designation of the division, regiment, company and organization to which the addressee belongs, as well as the name and address of the sender, and be fully prepaid by postage stamps affixed. Patrons of the post office should be instructed under no circumstances to attempt to designate on the addressed envelope the location of the unit. The correct manner of addressing such a letter would be as follows:

Return to
 Mrs. John Smith,
 — Blank Street,
 New York City.

Stamp

John Smith, Jr.,
 Co. X, — Infantry,
 American Expeditionary Forces.

Postmasters are to forward all mail matter addressed "American Expeditionary Forces" to New York. Postmasters are informed that letters, postcards and printed matter originating in the United States or any of its possessions for transmission to the United States Expeditionary Forces in Europe are subject to the United States domestic classification, conditions and rates of postage, and that letters, postcards and printed matter originating with such forces for transmission to the United States or its possession are likewise subject to domestic classification, conditions and rates of postage, except as modified by the provisions covering letters indorsed "soldier's letter" and contained in Section 406, Postal Laws and Regulations.

No other than United States postage stamps are valid for the prepayment of postage on matter described.

In accordance with a post office order, establishing a United States mail agency in France, postmasters are informed that money orders may be issued at domestic rates payable at such agency. Payment will be made promptly at headquarters of the agency or at the branch assigned to the military unit to which the payee belongs.

In drawing orders the office of payment should be designated as "U. S. Army Postal Service," and in the coupon the name of the payee should be followed on the next line by the regiment and company, or other organization to which the payee belongs.

There is no provision at present for parcel-post service, and postmasters are directed to refuse to accept for registration letters containing money or other valuables. Important papers which can be duplicated may be accepted for registration, but indemnity will not be paid for lost registered mail. The public should be warned that it is not safe to enclose currency in letters under any circumstances and that money orders should be used for transmitting money to members of the expeditionary forces.

THE NAVY

MAIL ADDRESSES, VESSELS OF U. S. NAVY.

For the convenience of those wishing to address mail to the vessels of the United States Navy, we publish the following official list giving post office addresses. Mail addressed "U.S.S. —, care of Postmaster" etc., as noted, will be forwarded by the Post Office Department.

Address mail for the Scorpion "in care of the Navy Department, Washington, D. C."

Care of Postmaster, New York City.

Alabama, Albany, Allen, Ammen, Amphitrite, Annapolis, Aphrodite, Arethusa, Arizona, Arkansas, Aylin.
 Bagley, Bailey, Balch, Baltimore, Beale, Benham, Biddle, Birmingham, Blakely, Bridge, Burrows, Bushnell.
 Caesar, Cassin, Castine, Celtic, Charleston, Chattanooga, Chester, Chicago, Christabel, Cleveland, Columbia, Connecticut, Conyngham, Culgoa, Cumberland, Cummings, Cushing, Cyclops.
 Dahlgren, Davis, Delaware, De Kalb, Denver, Des Moines, Dixie, Dolphin, Downes, Drayton, Dubuque, Duncan, Dupont.
 Eagle, Ericsson.
 Fanning, Florida, Foote, Flusser, Frederick, Fulton.
 Georgia, Glacier.
 Hancock, Hannibal, Hartford, Harvard, Henderson, Henley, Hopkins, Houston, Hull, Huntington.
 Illinois, Indiana, Iowa, Isla de Luzon.
 Jarvis, Jason, Jenkins, Jacob Jones, Jouett, Jupiter.
 Kanawha, Kanawha II, Kansas, Kearsarge, Kentucky, Kittery.
 Lamson, Lebanon, Leonidas, Louisiana.
 Macdonough, Machias, Maine, Marietta, Massachusetts, Maumee, Mayflower, McCall, McDougal, Melville, Michigan, Minneapolis, Minnesota, Missouri, Monaghan, Montana, Montgomery, Morris.
 Nashville, Nebraska, Neptune, Nereus, Nevada, New Hampshire, New Jersey, New York, Nicholson, Noma, North Carolina, North Dakota.
 O'Brien, Ohio, Oklahoma, Olympia, Ontario, Orion, Osceola, Ozark.
 Paducah, Panther, Parker, Patapsco, Patterson, Patuxent, Paulding, Paul Jones, Pennsylvania, Peoria, Perkins, Petrel, Pittsburgh, Pocahontas, Porter, Potomac, Prairie, Preble, Preston, Prometheus, Proteus, Pueblo.
 Raleigh, Reid, Rhode Island, Roe, Rowan.
 Sacramento, Sampson, San Francisco, Seattle, Shaw, Shubrick, Smith, Solace, Solf, Sonoma, South Carolina, South Dakota, Sterling, Sterett, Stewart, St. Louis, Sultana, Sylph.
 Tacoma, Tallahassee, Terry, Texas, Thornton, Tingey, Tonopah, Trippe, Truxtun, Tucker.
 Uncas, Utah.
 Vedette, Vermont, Vestal, Vesuvius, Virginia, Vixen, Von Steuben, Vulcan.
 Wadsworth, Wainwright, Walke, Wando, Warrington, Wheeling, Whipple, Wilkes, Winslow, Wisconsin, Worden, Wyoming.
 Yankton.
 C-1, C-2, C-3, C-4, C-5, D-1, D-2, D-3, E-1, G-1, G-2, G-3, G-4, K-1, K-2, K-5, K-6, L-1, L-2, L-3, L-4, L-9, L10, L-11.

CURRENT NEWS

A DENTAL CLINIC FOR THE FEEBLE MINDED

[*The Boston Transcript* of June 30th publishes the following account, which will be of interest to many readers of the JOURNAL:]

FINISHED 1,000 MOUTHS

LAUDABLE PERFORMANCE BY A PIONEER INSTITUTION

Dental Clinic for Feeble Minded Patients

There were no public ceremonies. Some young girls came into the little sunny room this morning to have their dental defects remedied, and when they flitted out of the parlor the Tufts College dental clinic at the Massachusetts School for Feeble Minded at Waverley came to a close for the season.

This was the end of the first season of a really remarkable institution. There is not another like it in this country, and some dental authorities claim that it is the first of its kind in the world, and that it is likely to be copied far and wide when its accomplishments become known. Those in charge have been reluctant about spreading information about this work while it was in an experimental stage; but it has passed that stage and will be reopened next October for its second season.

All the patients in this clinic are on a low plane of mental development. Many of them are old in years but mere babies in mental grasp, and have always been equally deficient in oral hygiene. A mouth of sound teeth is rare at the School for Feeble Minded, though there are nearly 1,700 patients, or pupils, at present. A score or more of these patients came into the clinic this morning for dental attention by Tufts College dental students under the direct observation of Dr. A. G. Richburg, who is the director of the clinic. Hundreds of the same class had been there before and have since been talking appreciatingly about the nice work that was done to their teeth. There is no dread of the dentist among them. In fact, visits to the clinic break the monotony of the school, and are looked upon more or less as social events which the patients will welcome again in the fall if memory carries them over the vacation period.

What this clinic signifies in the midst of an institution of 1,700 feeble-minded men, women and children will appear from its accomplishment during the four months of its existence. It was opened on March 1st. The record obtained from Dr. Richburg, as the clinic closed, shows that 1,448

teeth have been filled, 1,734 have been extracted, 330 cases of ulcerations have been treated, 1,008 of the patients have had the dental work on their mouths completed—they are called finished cases, implying that their mouths are now in good, healthy condition. In 1,069 cases anesthesia was used. All the patients with bad dental defects had them corrected during the spring, the dentists treating the emergency cases first. Having attended to the worst deformities, and the cases that were causing trouble, Dr. Richburg and his students from Tufts College began to examine all the patients, and have finished the work on more than 1,000 of the total of 1,700 in the school. As college work closes, the clinic had to close today, but Dr. Richburg will visit the school at least once a week to attend to emergency cases, and when the clinic is reopened in October the work will be resumed.

Then comes the upkeep work. There will be plenty for the clinic to do, and its work may become more thorough in the future, when emergencies are less frequent. Approximately 100 new patients come to the school every year.

It is said that there is nowhere in this country another public school for feeble minded where such attention is given to the care of the teeth of the patients. The news of the existence of this clinic is just beginning to spread. Some of the medical men who attended the recent Boston convention of physicians visited the Waverley school and expressed the highest admiration for the dental work, and some of them said that they would urge its adoption in the schools for feeble minded in their own States. Some of the results of the work at Waverley are evident at once, but the total result is expected to be a gradual improvement in both health and mentality of the patients. The dentists have found some of the patients' baby teeth that, of course, should have been removed long ago, still in position. They have found malocclusion. They have found many kinds of deformities and defects that have irritated the nerves, annoyed the patients in many ways, and in many instances prevented proper mastication and brought about malnutrition. In some cases there were only a few teeth left in the mouth. The treatment applied to such cases was the substitution of plates with full sets of artificial teeth that will enable the patients to chew their food properly and talk more distinctly. It is said that some of the patients have improved remarkably since the clinic was established, and with less to irritate them and better assimilation of their food, have really risen to a higher mental plane.

The work is so promising that it will be expanded in the future. Instead of remaining in the little room used this spring and summer it will be moved to a new building as soon as that building is completed. There it will have the whole basement, with all the improvements. It will be, as is now, a modern dental parlor, but will have much more room than it is now, a modern dental office, but will have much more room. Ten students from Tufts College have been coming every morning since last

March, each group of ten coming for one week. They have had the latest type of implements to work with, including the modern machine for giving oxygen and gas, which combines into an anesthetic that is effective and harmless for any length of time that it may be necessary.

The importance of thorough dental work for the feeble minded was realized by Dr. W. E. Fernald, superintendent of the school, and, in bringing about the establishment of this clinic, he took a step in advance of what had been done anywhere. President Herman C. Bumpus of Tufts College made the work possible by the coöperation that the college could give to its own advantage as well as for the good of the patients in the State school, and it was agreed that the clinic should be opened last March. Dr. William Rice, dean of the Tufts College Dental School, became deeply interested in the proposition and selected one of his assistant professors in clinical dentistry, Dr. A. G. Richburg, to take direct charge of the work at Waverley.

* * * * *

Dr. Alfred Fones, of Bridgeport, Conn., has been appointed chairman of the Oral Hygiene Committee of the Dental Section of the Council of National Defense. He will instruct and train 1,000 Red Cross nurses, who will then be sent to the sixteen different training camps in the country to do preliminary work toward putting the teeth of the soldiers in good condition. They will clean the teeth and make a report for the guidance of the dentists.

BOOK REVIEWS

MODERN DENTAL MATERIA MEDICA, PHARMACOLOGY AND THERAPEUTICS, Including the Practical Application of Drugs and Remedies in the Treatment of Disease. By J. P. BUCKLEY, PH.G., D.D.S., Professor and Head of the Department of Materia Medica, Pharmacology and Therapeutics, and formerly Director of the Chemical Laboratories, Chicago College of Dental Surgery. Fourth Edt., pp. 494, 146 illustrations: Philadelphia. P. Blakiston's Son & Co. Cloth, \$3.50.

This new edition of a standard textbook measures up well with what might be expected from its author. Professor Buckley requires no introduction, and it will be seen at a glance that his book has received careful revision, and that much important new material has been added—particularly in Part II—Practical Dental Therapeutics.

We commend the clear, logical definition and exposition of the sciences of materia medica, pharmacology and therapeutics, whereby the student of these subjects may acquire an orderly working knowledge of general principles. The section devoted to drugs and their uses is based upon the U. S. P. IX, and the National Formulary; the treatment of each topic is concise and clear—the proper emphasis being thrown on the dental uses of the drug or remedy.

The chapters on Metrology, Prescription Writing and Medical Latin, contain the essentials of these subjects in well digested form. Formal prescriptions are not given in this book until the art of writing them has been discussed, and thereafter only the formal method is used. This enables the student to approach his subject without confusion, and later affords practice in a department of medical knowledge too often neglected by the dental practitioner.

The chapters in Part II, on Practical Dental Therapeutics contain much special information which the author is peculiarly fitted to present. His topics include the diseases of the hard tissues of the mouth and associated structures; diagnosis and treatment of diseases of the dental pulp, including the destruction and removal of the organ; diagnosis and treatment of pulpless teeth and sequelæ, root canal preparation for filling, non-septic and septic pericementitis, acute and chronic alveolar abscess, etc., etc.

Under Pulp Removal the author gives the preference to pressure anesthesia, and we note with considerable interest that while brief allusion is made to novocain in the earlier part of the book, its use for conductive anesthesia in pulp removal is not even mentioned. In view of the almost universal adoption of novocain in this connection, and the relative

abandonment of cocain pressure anesthesia, this omission is very striking, and leaves the reader in doubt as to the writer's views on a very important matter.

The treatment of the subject of root-canal preparation and filling is quite full and interesting. The same may be said of the chapters on Discolored Teeth, Antrum, Pyorrhea and Neuralgia. The numerous illustrations (including twenty-two excellent colored plates) add considerably to the value of this text book.

DENTAL MATERIA MEDICA AND THERAPEUTICS. With Special Reference to the Rational Application of Remedial Measures to Dental Diseases. By HERMANN PRINZ, A.M., D.D.S., M.D., Professor of Materia Medica and Therapeutics, the Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania; formerly Professor of Materia Medica, Therapeutics and Pathology, and Director of the Research Laboratory, Washington University Dental School, St. Louis. Fifth Edition, Enlarged and Revised according to U. S. Pharmacopoeia, Ninth Decennial Revision. Pp. 645; full illustrated. St. Louis: C. V. Mosby Co. \$4.00.

This is notably a reference book for the practitioner desiring to enlarge and enrich his knowledge of dental medicine, rather than a text book for the undergraduate student. We do not wish to convey the impression that it is unsuited for the student's use, but simply that the author's obvious aim is beyond the class room. The reader is struck with the wealth of material applicable to daily practice; he feels that the writer not only has put his heart into his work, but that his qualifications for the task are ample. We are not surprised to hear that this book is being used widely in our Army and Navy.

The book is divided into four parts: General Therapeutics, Pharmacotherapeutics, Physical Therapeutics, and Local Anesthesia. In Part I the general principles of the subject are considered (after an elaborate but interesting introduction) under such headings as, The Aim of Therapeutics, Nature of Drug Action, Classification of Dental Remedies, Methods of Administering Medicines, Prescription Writing, Incompatibilities, Weights and Measures, Narcotic Law, etc., etc.

Part II, or Pharmacotherapeutics, is divided under (a) Drugs Which Exercise no Definite Action on Specific Organs; and (b) Drugs Which Act on Specific Organs, Under the former heading, (a) are considered at great length, Antiseptics, Astringents, Caustics, Hemostatics, Protectives and Demulcents, etc., Irritants and Counter Irritants, and Antacids;—under the latter (b), we find Drugs Which Act on the Mouth and Teeth—on Peripheral Nerves—on Central Nervous System—on Gastro-Intestinal Tract—on Circulation—Respiration—Metabolism—Secretions—Temperature. This arrangement is somewhat novel but the reader will find no difficulty in running down the item he desires.

Interesting and valuable chapters are given in Part III, on Artificial Hyperemia, Massage, Light Therapy, Heat and Cold, Plugging Bone Cavities, etc., and Electro-Sterilization. Part IV is devoted to Local Anes-

thesia; and that important topic is given the space and attention it deserves. An appendix comprises a chapter on the diagnosis of pulp diseases by the electric current, a dose table, glossary of therapeutic terms, and tables giving useful collateral information.

We believe this new edition of a standard work will add to the reputation of its author for scholarship and care in details, and that the book will find its way to every well-equipped dental and medical library.

CORRESPONDENCE

154 Metcalfe Street,

Montreal, 30 June, 1917.

Editor, THE JOURNAL OF THE ALLIED DENTAL SOCIETIES:

DEAR SIR: Professor Gies' able and voluminous article in the December number of the JOURNAL OF THE ALLIED SOCIETIES under the heading "Professional *versus* Trade Journalism in Dentistry," and in which he attacks the present trade-owned status of the majority of our dental journals, has called forth a forceful, not to say savage rejoinder from Doctor T. P. Hyatt. Dr. Hyatt in his anxiety to take up the cudgels for his friends, the editors of the journals, assumes that Professor Gies has impugned their standing as professional men. Be that as it may, Professor Gies in his article is pleading for the freeing of the dental profession from dependence upon the dental supply trade for their current professional literature.

No one (certainly not Professor Gies) denies the sagacity and ability of the business management of the trade journals, which puts men of light and leading into the editorial chairs.

The contents of the journals are a means of education which if neglected by the practising dentist brands him a wilful ignoramus and a back number. But because the trade journals are well and ably managed it is necessary to remind ourselves that "the Good is the enemy of the Best." The ability displayed by the trade in this respect tends to lull the profession to sleep and to take away any desire to make the effort to be free.

Professor Gies only calls attention to what is known by all to be a fact, that editors of journals owned by the trade are by the nature of their contract bound to protect the interests of the trade when those interests come into conflict with the interests of the profession. By accusing Professor Gies of insulting the members of the profession in his attempt to arouse us to strive for independent journalism, Dr. Hyatt discredits what to most professional men will appear to be a weak case. Dispassionate readers will be inclined to the opinion that Dr. Hyatt comes perilously near to the ungentlemanly and unfair conduct with which he charges Professor Gies.

The profession of dentistry is still in its infancy. Hitherto men of scientific attainment and habit of mind have been few and far between, but the professional and scientific spirit is growing, and if, as seems likely, the development of mechanical aids to our work becomes relatively less,

dependence upon scientific investigation for the advancement of our profession in knowledge and power for good, will become relatively greater. We may reasonably hope to be able to demonstrate that "Prevention is better than Cure" by more exact knowledge of the laws governing the physiology and pathology of the mouth and teeth. The Supply House then will not loom quite so large on our horizon as it has in the past, and independent professional journalism will follow as a natural consequence.

Those dentists who regard their calling as chiefly a means of giving rather than getting, will be grateful to Professor Gies for having laid his axe to the root of the Upas Tree of Trade-owned Dental Journalism and will wish him well in his herculean task.

F. ARNOLD STEVENSON, D.M.D.

NOTICES

NATIONAL DENTAL ASSOCIATION ANNOUNCEMENTS

TWENTY-FIRST ANNUAL SESSION OF THE NATIONAL DENTAL ASSOCIATION.

NEW YORK CITY, OCTOBER 22, 23, 24, 25, 26, 1917.

(All sessions of the Board of Trustees, House of Delegates, General Sessions, Section Meetings, Clinics, (except Surgical Clinics), exhibits will be held in Hotel Astor.)

Partial Program

Up to date the following reports have been received from the various Section Chairmen, Committeemen, etc.

Section I.—Chairman, Dr. E. D. Coolidge, 59 East Madison Street, Chicago, Ill.

"Some Neglected Operative Pre-requisites," by Dr. Fred E. Hart, San Francisco.

"Porcelain Inlays" (except title not yet chosen), by Dr. W. L. Fickes, Pittsburgh, Pa.

"Interpretation of Radiographs," by Dr. Howard R. Raper, Indianapolis, Ind.

"Present Tendencies in Operative Dentistry," by Dr. J. M. Walls, St. Paul, Minn.

Also an important paper dealing with the subject of dental education. Essayist not selected as yet.

Section II.—Chairman, Dr. F. B. Moorehead, People's Gas Building, Chicago, Ill.

Dr. Virgil Loeb of this Committee reports that he has thus far accepted two essayists. Dr. Elmer S. Best, Minneapolis, on some phase of roof canal filling; and Dr. Howard R. Raper, Indianapolis, on "Misinterpretation of Radiographs."

Section III.—Chairman, Dr. L. E. Custer, 28 North Ludlow Street, Dayton, Ohio.

"Ionization, With Special Reference to Ionic Chemistry," by Dr. Geo. T. Fette, Cincinnati, Ohio.

"The Chemical Action of Soil Bacteria on Calcium Phosphates, With the Chemical Analysis of the Human Teeth," by Dr. J. E. Hinkins, Chicago, Ill.

"Why Measurements of the Mandible, Tracings of the Condyles,

the Construction of Hypothetical Triangles, and the Use of the Face-Bow, are all Non-Essential in the Construction of Dentures Possessing the Highest Degree of Efficiency," by Dr. D. D. Campbell, Kansas City, Mo.

Paper, subject to be announced later, by Dr. Calvin S. Case, Chicago, Ill.

Also two other papers, titles of which will be reported later.

State Society Officers' Section.—Chairman, Dr. John C. Forsyth, 430 East State Street, Trenton, N. J.

First Session. "Some Phases of Post-Graduate Work," by Dr. B. L. Shobe, Tulsa, Okla.

"Securing Some Satisfactory Legislation," by Dr. Alexander H. Reynolds, Philadelphia, Pa.

The Second Session will be devoted to six or seven short papers of five to ten minutes each by men of different State Societies, telling of some outstanding feature of their State Society's work that is thought to be of the greatest importance, or, if the essayist prefers, he may present the weak part of the work and ask for suggestions to help out. These papers are to be followed by a general discussion which we hope will bring out some very valuable points. The means of the essayists for this session have not as yet been secured.

Committee on Anesthetics.—The Secretary of this Committee, Dr. Chalmers J. Lyons, Ann Arbor, Mich., reports as follows:

"The Teaching of Conductive Anesthesia," by Dr. Theodore Blum, New York City.

"After-Pain in Local and General Anesthesia," by Dr. A. E. Hertzler, Kansas City, Mo.

"The Toxicity of Local Anesthetics," by Dr. Geo. B. Roth, Washington, D. C.

Committee on Entertainment.—At a recent meeting of this Committee, a Ladies' Auxiliary was organized, of which Mrs. Dr. M. L. Rhein was made the chief officer, and Mrs. Dr. Henry W. Gillett, 140 West 57th Street, New York City, Secretary. It would greatly facilitate the endeavors of the Ladies' Auxiliary to add as much as possible to the pleasures and comforts of the visiting ladies, if those who intend to come to New York would notify Mrs. Gillett, stating, if possible, the hotel at which they will be registered.

R. OTTOLENGUI, Chairman Publicity Committee.

[The following additions may be announced to the program as already published:]

MONDAY, OCTOBER 22ND.

Registration, Laurel Room, First Floor.

First Session—Board of Trustees, 11 A. M. (Rose Room—First Floor.)

HOUSE OF DELEGATES.

Opening Session, 2 P. M. All Sessions of the House of Delegates will be held in the Rose Room, First Floor.

Second Session—Board of Trustees, 4 P. M. (Rose Room—First Floor.)

FIRST GENERAL SESSION.

Hotel Astor. (Grand Ball Room—First Floor.)

TUESDAY, OCTOBER 23RD., 9 A. M.

Invocation.

..... New York City
Address of Welcome—Gov. Charles S. Whitman, on behalf of State....
..... Albany, N. Y.
Mayor John P. Mitchel, on behalf of City New York City
President's Address—LaFayette L. Barber Toledo, O.
Oration—E. C. Rosenow (M.D.) Rochester, Minn.

A research member of the Memorial Institute for Infectious Diseases, Chicago, and Professor of Experimental Bacteriology in the University of Minnesota and the Mayo Institute.

SECOND GENERAL SESSION.

TUESDAY, OCTOBER 23RD, 8 P. M.

(Grand Ball Room—First Floor.)

RESEARCH DEPARTMENT.

PATHOLOGICAL, BACTERIOLOGICAL AND CLINICAL STUDIES.

"Dental Caries"—By Russell W. Bunting and U. G. Rickert (B.S., M.A.)

Work done in, and with the assistance of, the University of Michigan.

"A Study of the Pathology of the Peridental Membrane"—By Frederick B. Noyes.

Work done in, and with the assistance of, the University of Illinois,

"The Histopathology of Chronic Periodontitis and the Pathogenesis of Dental Root Cysts"—By Thomas B. Hartzell and Arthur T. Henrici, (M.D.).

Work done in, and with the assistance of, the University of Minnesota.

"A Comparative Study of Oral Focal Infections"—By Weston A. Price and Milton J. Damlos (D.D.S.). Research Institute Laboratories, Cleveland, Ohio.

THIRD GENERAL SESSION.

WEDNESDAY, OCTOBER 24TH, 8 P. M.

(Grand Ball Room—First Floor.)

Herbert L. Wheeler, Chairman New York City
DENTAL SURGERY AND RESTORATIVE PROSTHESES IN THE EUROPEAN WAR.

Symposium—"Dental Surgery and Restorative Prostheses in the European War."

"*War Dental Surgery*"—By.....

"*War Dental Restorative Prostheses*"—By.....

It is expected that Mr. Robert Bacon, ex-Ambassador to France, will preside, and that the Surgeons General of both the Army and Navy will attend. A description of the work done in Europe will be given by one who has had experience there.

It is anticipated that both the Medical and Dental Professions will be represented.

There will also be pictures of "War Surgery."

HERBERT L. WHEELER, *Chairman*.

FOURTH GENERAL SESSION.

THURSDAY, OCTOBER 25TH, 8 P. M.

(Grand Ball Room—First Floor.)

Oral and Dental Hygiene—Mass Meeting.

Charles H. Oakman, ChairmanDetroit, Mich.

"*The Importance of Dental Infections as Related to Urinary Tract Diseases, with Particular Reference to Ureter Stricture and Its Sequelæ*."

Guy L. Hunner (S.B., M.D.) Johns Hopkins University, Baltimore, Md.

RESEARCH DEPARTMENT.

WEDNESDAY, OCTOBER 24TH, 1:30 P. M.

"*Root Canal Fillings*"—By John R. Callahan.

Work done in, and with the assistance of, the Cincinnati General Hospital.

"*Studies Upon the Bacteriology of Dental Caries*"—By Percy R. Howe.

Work done in, and with the assistance of, the Forsyth Dental Infirmary.

"*Quantitative Determinations of Certain Organic Substances in Saliva and Their Relation to Oral Conditions*."—By John A. Marshall (M.S., D.D.S.).

Work done in, and with the assistance of, the University of California.

"*Electrolytic Medication—Physiological and Dental Aspects*"—By Samuel E. Pond (B.H., A.M.) and Weston A. Price, Research Institute Laboratories, Cleveland, Ohio.

THURSDAY, OCTOBER 25TH, 9 A. M.

CHEMICAL AND METALLURGICAL STUDIES.

"*Dental Cements*"—By Marcus L. Ward.

Work done in, and with the assistance of, the University of Michigan

"Progress of the Investigation of Mottled Enamel"—By Frederick S. McKay, Colorado Springs, Colo.

"Studies of Internal Secretions in Their Relation to the Development and Condition of the Teeth"—By William J. Gies (M.D., Ph.D.).

Work done in, and with the assistance of, the Columbia University.

"The Relative Efficiency of Medicaments for the Sterilizing of Tooth Structures"—By Matilda Moldenhauer (A.B., M.S.) and Weston A. Price, Research Institute Laboratories, Cleveland, Ohio.

PREPAREDNESS LEAGUE OF AMERICAN DENTISTS.

TUESDAY, OCTOBER 23RD, 1:30 P. M.

(College Hall—Eighth Floor.)

"The Relations of the Dental to the Medical Corps of the Army"—By Victor C. Vaughan (M.D.), ex-President of the American Medical Association, Member General Medical Board of the Council of National Defense, Washington, D. C.

"The Value of the Educational Work as Being Executed by the Preparedness League of American Dentists."—By Frank M. Casto, Cleveland, Ohio.

"Report of Sectional Units of League by States—A to N Inclusive."

THURSDAY, OCTOBER 25TH, 1:30 P. M.

"Stereopticon Lecture on Fractures of the Bones of the Face."

(Synopsis: This lecture will include the consideration and treatment of gun shot wounds; removing foreign substances; the sterilization of wounds; the proper adjustment of fragments and the means employed to mobilize them. In the treatment of injuries of the face, the primary step should be, after removing foreign substances, to establish as nearly as possible, asepsis. The use of grafts of bone, modeling compound, hard rubber and metals to replace lost parts.)

"The Dental Ambulance in War"—By George B. Hayes, Neuilly, (Paris) France.

"Report of Sectional Units by States—M to Z Inclusive."

(An interesting Preparedness Exhibit will be shown, including Dental Ambulances, Base Hospital, Field Hospital and First Aid Equipments; in fact, everything relative to the service of the Officers' Reserve Corps, Dental Section, and Red Cross Officers will be present to give instruction and information. The ambulances shown will be sent to France as the gift of members of the Preparedness League and appreciative patients.)

ANESTHETISTS' SECTION.

WEDNESDAY, OCTOBER 24TH, 1:30 P. M.

(East Ball Room—Eighth Floor.)

"*The Teaching of Local Anesthesia*"—By Theo. Blum, New York City.

"*The Relative Toxicity of Local Anesthetics*"—By George B. Roth, Washington D. C.

"*Cause of Failure and Untoward Sequelæ in Conductive Anesthesia*"—By Richard H. Riethmiller, Montclair, N. J.

(Illustrated by Moving Picture Film.)

THURSDAY, OCTOBER 25TH, 9 A. M.

"*After-pain in Local and General Anesthesia*"—By A. E. Hertzler, Kansas City, Mo.

"*General Anesthesia for Oral Surgery*"—By Herbert A. Potts, Chicago, Ill.

STATE SOCIETY OFFICERS' SECTION.

WEDNESDAY, OCTOBER 24TH, 9 A. M.

(College Hall—Eighth Floor.)

"*Post Graduate Course*"—By B. L. Shobe, Tulsa, Okla.

"*State Legislation from a Dental Standpoint*"—By A. H. Reynolds, Philadelphia, Pa.

"*Taking an Invoice of Our State Societies*"—By Otto U. King, Huntington, Ind.

WEDNESDAY, OCTOBER 24TH, 1:30 P. M.

"*Organization*"—By J. P. Luthringer, Peoria, Ill.

Symposium—"Method Used in Handling the Mid-Winter Dental Clinic, Atlanta Dental Society"—By Thomas P. Hinman, Atlanta, Ga.; S. M. Cameron, Philadelphia, Pa.; Benjamin Sandy, Minneapolis, Minn.; Henry L. Whipple, Quincy, Ill.

(These papers will be limited to ten minutes each, and followed by general discussion.)

R. OTTOLENGUI, *Publicity Committee.*

XI PSI PHI FRATERNITY

The alumni of the Xi Psi Phi Fraternity will hold a dinner at the Waldorf-Astoria Hotel on October 22, 1917.

All the alumni of the fraternity are most cordially invited to attend. For particulars write Dr. J. Nobert Gelson, 282 Park Place, Brooklyn, N. Y.

SUBJECT INDEX FOR SEPTEMBER

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THE JOURNAL

OF THE

ALLIED DENTAL SOCIETIES

VOL. XII

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No. 4

DEVIATIONS FROM THE NORMAL IN THE TEETH AND THEIR SUPPORTING STRUCTURES¹

By L. M. WAUGH, D.D.S., NEW YORK CITY

THE task set by the Executive Committee is by no means an easy one, since the title really embraces much the greater part of Oral Pathology. However, in the symposium which its members have planned for the year's work, it seemed to be the only logical arrangement. It would be impracticable to attempt, in one essay, a *detailed* consideration of so broad a subject; therefore, it will be the aim at this time to review only the well-established principles for the pathologic reasoning that shall guide us in practice. It is hoped that these will be much enlarged upon, in the discussion.

It must be constantly borne in mind that the *normal*, in function and in structure, is *the basis* for pathologic study, or in other words, that a full knowledge of the minute structure and normal function of a part in *health* is essential to its most intelligent treatment, when in a condition of disease. The title of the essay, "Deviations from the Normal," does not strictly imply disease. Attention was called to this by Dr. Noyes at our last meeting in his discussion of the terms, health, deformity, abnormality and disease. While deformity and abnormality may

¹ Read before the First District Dental Society, S. N. Y., November 5, 1917. See disc., p. 493.

exist without disease in a *general* sense, this applies less strictly to the human mouth than to other parts of the body, because the rugged stress necessary to the performance of its function makes it essential, if a maximum state of health is to be maintained, that (a) the soft tissues be protected by teeth that are neither deformed nor abnormal and (b) for the proper cleansing friction of mastication the teeth must be normal in form and position.

Health or *physiologic function* is the *general average* of cell action and function. This is not a fixed point, but comprises a range within which cells functionate normally. When from any cause the cell activity is raised or lowered beyond the general average, or in other words, oversteps the physiologic boundaries, a condition of disease exists.

Disease, it must always be remembered, is not a *fixed* state, but a *process* involving a *series* of *changes*. Disease frequently exists, even in advanced form, without the consciousness of the individual.

The study of the changes occurring in disease is termed Pathology. *Pathology* is that branch of science which treats of modifications in function and changes in structure occurring in disease.

Oral and *Dental* Pathology may be defined as modifications in function and changes in structure occurring in diseases of the mouth, the teeth and associate parts.

We must constantly remind ourselves that disease in the oral cavity is but a branch of disturbed human function. It must not be segregated from the body as a whole. The tissues of the mouth have coursing through them the same blood that supplies the other tissues of the body. This is constantly bringing a fresh supply of nutrient material and just as persistently removing the waste products resulting from cell metabolism. It has been estimated that a colored blood corpuscle may travel from the capillaries of the mouth to the plantar surface of the foot in a few seconds. On the way, the corpuscles traverse tissues in all parts of the body. If, from any cause, morbid products are formed in the oral tissues, these are conveyed in the circulation and have a proportionate morbid influence on receptive tissues. And con-

versely, the tone of remote parts has its influence in the tissues of the mouth. Invading microorganisms and their products may be similarly carried. Some of the most obstinate oral disorders have their seat in distant organs and a cure can be brought about only through a return of those connected organs to a state of physiologic activity; therefore, the state of *health* in the oral cavity is dependent upon physiologic function of the tissues and organs of the body as a whole, which in turn are dependent upon physiologic function in the oral cavity. Thus only can the cycle of health be complete. This fact should be constantly in the mind of the dentist.

The Deciduous Denture

The deciduous teeth have two principal functions. 1, that of mastication; 2, that of influencing the development of the bones of the face and the cranium.

The mandible at birth is practically straight. With the eruption of the teeth, the ramus develops and the body of the mandible undergoes growth. This is manifest by a thickening of the bone from the mental foramen to the alveolar border and the ramus begins to approach a right angle with the body of the bone. The mandible performs two functions, (a) respiratory and (b) masticatory. Both influence its development. At birth all of the teeth have begun to develop except the second and third permanent molars. The tooth germs lie embedded in the cancellous interior of the jaws. In the upper, they occupy almost all of the area to the floor of the nose and orbit. The maxillary sinus or antrum develops later. Each tooth germ occupies a separate crypt, and as the germ grows the pressure it exerts pushes the crypt deeper into the cancellous bone. Coincident with the growth of the tooth germs is that of the tongue and associate parts, these exerting pressure upon adjacent surface of the bone. The muscles attached, transmit force to the periosteum and bone, and in the acts of mastication, deglutition and respiration these serve as a mechanical stimulus to bone growth. These forces must act in harmony or the teeth when they erupt may meet outside the influence of the proper inclined planes, causing the beginning of malocclusion. Any malocclusion disturbs the

balance in the distribution of force and results in a disturbance of bone development which, according to Noyes, progresses during the entire period of development.

Usually between the seventh and ninth months the central incisors begin to appear. As the tooth lengthens, the bone from the side of the crypt grows into the wall of the alveolus. As the tooth moves occlusally, the root gradually lengthens. At the same time the tongue and lips exert pressure and influence the direction of bone growth. The jaw thickens and grows forward and outward. The growth of each successive tooth is exerting pressure upon those previously erupted, causing them to move more to the occlusal. This is repeated until at about two and one-half to three years the twenty deciduous teeth are in place and all normally in proximal contact. The stimulus provided by proper mastication and by the constantly growing follicles of the permanent teeth brings about sufficient growth so that at five to six years of age spaces have appeared between all of the teeth except the molars. Spacing at this age is just as much normal and to be desired as is the enduring contact in the permanent set. If this spacing does not occur it indicates improper development, which must be corrected by artificial means, or the permanent teeth will erupt either in rotation or out of the line of the arch.

All restorative operations must be made to at least retain the mesio-distal diameters of the teeth. The practice of filling adjacent proximal cavities with one unseparated mass of rigid filling material may sometimes be harmful. If, for any reason, a deciduous tooth must be prematurely lost, *immediate* means should be provided for maintaining the space, otherwise the teeth will shift together. This may lead to impaction of the developing permanent tooth or of its being forced out of the line of the arch, and what is more important, if left uncorrected, it will tend to allow the developing permanent first molars to take positions anterior to the normal. Each deciduous tooth has a definite function in the development of normal occlusion of the permanent set. In the order of their importance they are: the cuspids, the molars and the incisors, the upper being less necessary than the lowers.

The importance of maintaining in harmony all develop-

mental forces at this tender age becomes apparent when considering the growth of the brain. At birth its average weight is 371 grams; at six years, about the time the first of the deciduous teeth begin to be replaced, it averages 1360 grams. This shows a growth of almost 1000 grams during the first six years after birth. At 19 years the average brain weighs 1400 grams, or a growth of only 40 grams during the 13 years elapsing between the sixth and nineteenth years. The increase in general body weight during the presence of the deciduous dentition is also striking. From the age at which it becomes complete to the time when all have been replaced, the weight of the average normal child has increased approximately threefold. The permanent first molars appear about the sixth to seventh year to the distal of all the deciduous teeth. The lower usually slightly precede the upper. These four teeth are of utmost importance, both in maintaining the relations of the jaws and in doing the principal masticating while the deciduous teeth are being replaced by their permanent successors. An abnormal relation of these teeth will entirely change the direction of forces which will be manifested by a modification of bone development. The permanent central incisors are now replacing the deciduous ones. If proper spacing occurs, it greatly facilitates their assuming the normal place. The laterals will follow in a similar manner at about the seventh to the ninth year, the proximal surfaces meeting normally with the centrals will exert pressure and aid in stimulating bone development. Proper proximal contact is essential to proper bone development. Then will follow in similar manner the first bicuspid, the second bicuspid, the cuspid and permanent second molar at about the fourteenth year. If all forces have acted normally, the teeth will have come to their proper positions. Unfortunately, however, only about 11 per cent. of individuals have normal occlusion without orthodontic assistance.

The too long retention of deciduous teeth is equally as harmful as premature loss. Sometimes their roots are resorbed very slowly and the tooth too long retained. Again the tooth may become wedged between erupted permanent teeth. By means of a roentgenogram it can be determined whether the permanent tooth is developing, and if so, the deciduous tooth should be extracted

without delay. In fact, I believe it to be the best practice to have very badly decayed and abscessing deciduous teeth removed *without delay* and means *immediately* provided for the prevention of the closing of the space. The deciduous second molar, if too long retained, is almost certain to cause decay on the mesial surface of the permanent first molar. This is probably due to the form of contact. The deciduous molar is broader than the bicuspid for which the mesial surface of the permanent first molar is shaped to contact.

A retained deciduous tooth should not be removed until a roentgenogram proves the presence or absence of the developing permanent tooth.

Bone development in the jaws is largely dependent upon proper mastication on the sound physiologic principle that "the use of an organ determines its strength." Therefore the teeth should at all times be in such condition that thorough mastication can take place in entire comfort and the child then encouraged to make thorough use of the teeth.

The question as to the age at which orthodontic treatment should be given is one of utmost importance. Dr. F. B. Noyes has said: "Treatment is indicated just as soon as a malocclusion is sufficiently pronounced to be apparent." I should like to add, "apparent" *that Nature cannot correct the condition unaided.*

It is surely better to *guide* a tooth to proper position and have it retained by the *primary* alveolus than to allow it fully to erupt in malposition. In the latter condition it becomes necessary to exert sufficient pressure to bring about the resorption of the primary alveolus and a new or secondary one has to be constructed about the tooth in its corrected position.

The greatest development in the jaws and teeth takes place from the eighth to the twelfth year, and naturally, treatment can be greatly aided by the active natural developmental forces. Tooth movement is usually considerably more difficult after this period.

On general principles it is also best that correction be made before the age of puberty.

The Permanent Denture

The permanent teeth in normal occlusion should become the visualized ideal of every dentist. This picture should be constantly in his mind's eye during all restorative procedures, for it forms the very basis of the practice of dentistry. It has practical application from the age at which the deciduous teeth are fully erupted, through all stages of conservative dentistry and to the time when the construction of complete artificial dentures becomes necessary. Therefore these principles have application during the entire dental life of the individual.

Normal occlusion is defined by Angle as "the normal relations of the occlusal inclined planes of the teeth when the jaws are closed."

In studying the occlusion of the lateral half of the jaws, it will be observed that each tooth has two antagonists in the opposite arch, except the lower central incisors and the upper third molars. With the incisors and cuspids the labial surfaces of the lowers rest upon the lingual surfaces of the uppers. The extent of overbite depends upon the depth of the cusps of the bicuspid in coördination with the angle of descent of the condyle path. The bicuspid and molars on each side, viewed collectively, consist of a series of cones or cusps and strong ridges, mostly the marginal, bounding fossae or depressions. These are so fitted together when the teeth are in occlusion that the fossae receive cusps of the opposing teeth, forming some thirty mortars and pestles for the grinding of food and also for the important purpose of maintaining each tooth in proper place by providing for it a definite and positive resting position. The line of *lingual* cusps of the *upper* are received into the groove between the lingual and buccal cusps of the lower, while the *buccal* line of cusps of the lower are correspondingly received into fossae of the upper.

The study of the *mesio-distal* relations may best begin with the permanent first molars. They are not only the first of the permanent teeth to erupt, but are the most important of the permanent set. Angle speaks of the upper as the "key to occlusion." Its mesio-buccal cusp occludes on a line with the buccal

groove and its mesio-lingual cusp into the mesial fossa of the lower first molar. The lingual cusp of the upper first bicuspid is received between the buccal and lingual cusps of the two lower bicuspids, its point corresponding to the line between the mesial marginal ridge of the second and the distal marginal ridge of the first. The lingual cusps of all the posterior teeth antagonize those of two opposing teeth, except the upper third molar, which occludes with but one tooth, its distal inclined planes being disengaged. The summit of the buccal cusp of the upper first bicuspid is placed on a line with the interproximate space between the two lower bicuspids and to the buccal side. The general arrangement of the second bicuspids and molars is relatively similar. The lower third molar contacts two upper molars.

The articulation, or better, the antagonization of the teeth, is a mechanical problem, and its comprehension necessitates an understanding of the universal anatomic peculiarities of the temporomandibular articulation and the varied muscle pull as influencing mandibular movement. Time will forbid a detailed consideration, suffice it to quote from Angle's seventh edition, page 12, paragraph 2, in italics: "The sizes, forms, interdigitating surfaces and positions of the teeth in the arches are such as to give to one another singly and collectively the greatest possible support in all directions." The form of proximal contact is very important. The ideal is seen in teeth with smooth, well-rounded proximal surfaces and well-marked embrasures, leaving the lingual and buccal angles free from contact and possessing relatively narrow cervices so that the interproximal space widens nicely from the contact point. This V-shaped opening is normally nearly filled with gum septum, while in contrast to this will sometimes be seen flat proximal surfaces, contacting almost from the buccal to the lingual angle, leaving almost no embrasures and a very small interproximal space.

Dr. Noyes called attention last month to the fact that when the mouth fluids are normal, the teeth well formed and in normal occlusion and the proper food is properly eaten, *natural* cleansing has been provided sufficient for preservation of the teeth and health of the gum. Insufficient mastication, therefore, will lessen the friction necessary to the cleansing of the teeth, health of the

gum and strength of the jaw. It is notable in this connection that the Esquimaux, an undersized race, have the best developed jaws. They are known to give their teeth unusual use, they chew leather in the tanning process and soften frozen boots by the same unpalatable means.

In restorative operations, it is essential to the efficiency of the teeth, and especially to the health of the supporting structures, that the occlusal form be governed by the principles of normal occlusion and harmonized with the conditions present in the mouth. It is essential that correct inclined planes be reproduced. Angular fossae and grooves should always be made unless they would interfere with the strength of the work. Especially important is the reproduction of the marginal ridges. Their form is most important in mastication and is essential to the protection of the septal tissues. The position and form of the contact point is also of essential importance. G. V. Black estimated that at 40 years there has been a natural shortening of the arch, due to wear of enamel contact points, amounting to eight or nine millimeters. If enamel will undergo this much wear, that of even the hardest filling material must be much greater. Very important also is the correct reproduction of the form of the lateral walls, especially at the gingival. Neglect of this will result in irritation to the gum margin in the mastication of food.

Mal-occlusion is the most potent factor in the production of disease of the teeth and their supporting structures. It militates against proper mastication, prevents thorough natural and artificial cleansing, thus favoring caries and resulting in shock and injury to the supporting structures.

We shall consider briefly the last. This condition has been given by Dr. Paul R. Stillman the expressive term, *traumatic occlusion*. If permitted to persist it may lead to atrophy of the supporting tissues and will lessen their resistance to invasion by pathogenic microorganisms. So-called pyorrhea must be regarded as only a *symptom*. The disease proper must be determined and the cause removed if the condition is to be remedied. It is variously estimated by authorities that in 70 to 80 per cent. of cases the cause is malocclusion and improper restoration of tooth form about the gingival tissues. The subgingival space is

the vulnerable point, and it is here that the first evidence of disease of the soft tissue is most commonly seen. The gingival border or dental ligament is composed of interlacing bundles of fine fibers extending from the peridental membrane and periosteum. In health, it is of a glistening light-pink color, is tense and tough and terminates in a fine edge hugging the cervical ridge of enamel with glove-like closeness. It overlaps, but is not attached to the enamel. This area is termed the subgingival space. The surface is covered with epithelial cells, which are continuous with those covering the outside of the gum. In health, there is no true space and the fine edge is protected by the cervical bulge of enamel. In mastication, the food masses pass over the lateral surfaces of the tooth and through the embrasures to glide over its free surface. The cleansing friction thus induced is the most potent factor in the maintenance of its health.

When normal proximal contact is destroyed or improperly restored, or the normal cervical tooth form not correctly reproduced, in making crowns, fitting bands or clasps and in shaping fillings, the gingival margin loses its normal mechanical protection and the gum margin soon becomes hyperemic and everted. Then a true subgingival space is formed. In this area food debris, microorganisms and salivary calculus find a ready harbor. If allowed to persist, the underlying alveolar border undergoes atrophy and the root becomes exposed. Being hyperemic, the soft tissue is quite prone to infection. Unless the cause is determined and removed, the destructive process will continue until the peridental membrane and alveolus are destroyed and the tooth becomes exfoliated. In so far as that tooth is involved, the traumatic occlusion is overcome, the active irritant being thereby removed. If remaining teeth are allowed to shift into the newly made space, further traumatic occlusion is induced and other teeth become involved, oftentimes in remote parts of the arch.

Dental Caries

Dental caries is the destruction of the hard tooth structures as the result of acid fermentation and liquefaction

It is the most common and most constant disease to which human flesh is heir. It has been prevalent in all ages and among

all known races, both civilized and savage. A popular impression has existed that caries is of modern origin, and that it is due to an artificial mode of life. It has been claimed that our early progenitors were free from its ravages and retained their teeth to a late period of life, and that with each succeeding generation the teeth tend to become progressively less resistant. This is not substantiated by history. In the British Museum in London is the skull of an Egyptian mummy, dated 2800 years B. C., or over 4700 years from the present, exhibiting well marked tooth decay and evidence of other oral disease, appearing in every way similar to that of to-day. In museums in all civilized countries are innumerable crania exhibiting the effects of caries and its sequellae. The first scientific effort recorded to determine the cause appeared in dental literature about 1776. Many theories were advanced, the three finding most favor in their time being (a) the inflammation or vital, (b) the electric and (c) the chemico-parasitic. Here the matter rested amid much conflict of opinion until 1882, when Miller advanced the results of his research, in which he established the following basal facts:

1. That in all cases microorganisms exist in the tubules of carious dentin and that bacteria are present at all times in the mouth.

2. That invasion of the tubules is always preceded by decalcification of the dentin, *i. e.*, an area, sometimes relatively large, of decalcified dentin may be seen in advance of the organisms.

3. That dentin, softened by decay, was decalcified either in part or completely.

4. That blue litmus turns red, proving that an acid is present.

5. Food substances taken into the mouth are of all classes: (a) carbohydrates, including starches and sugars, (b) fats or hydrocarbons, and (c) nitrogenous such as albumins, meats, etc.

Miller's findings demonstrated conclusively that dental caries occurs as a result of bacterial action. That a great many mouth bacteria produce acid fermentation in carbohydrate foodstuffs. Black, working in this field about the same time, called attention to the additional fact that the acid must have direct action upon the tooth structure, and being in a nascent state, is capable of

causing decalcification. This is followed by a liquefaction of the remaining organic part.

These facts contradicted the inflammation or vital theory, which claimed that the carious process began *within* the tooth and likewise the electric theory which involved both external and internal conditions and proved that the initial lesion is due to *external* influences.

These five basal facts have held ever since, extending over a period of 35 years, during which time the science of bacteriology has been several times almost revolutionized. Many attempts have been made to disprove and to elaborate Miller's findings, always with the same negative result. It would seem that the time is now past due for dentistry to accept these findings as conclusive and to devote more thought to the application of the principles propounded as a guide for daily practice.

These five basal facts, important as they are, do not, however, solve the whole problem of dental caries. They explain only the *exciting cause*, while the *predisposing causes* lead to a vast field which, despite much effort, has been explored with but scant success.

While all of Miller's five facts are important, we shall dwell briefly from a practical standpoint, on only the second and the fifth.

In the *second*, he called attention to the fact that "invasion of the tubules is always *preceded* by decalcification of the dentin." (See Fig. 1.) Therefore dentin not softened by having its inorganic constituent removed must be regarded as *non-infected* dentin, except on its exposed surface. This led G. V. Black to decide against the use of disinfectant agents in a cavity that is protected from the oral fluid during excavation to solid dentin. In the present quandary as to what may be the condition of the dentin in teeth from which the pulps have been removed, it would seem that this fact would have a most important practical bearing. Before it can be established that the tubules of dentin in a pulpless tooth are invaded by microorganisms it must be proved that this is possible *without* decalcification. Miller proved that it is *impossible* while the pulp remains alive, and since microorganisms invade only in search of pabulum, it seems reasonable

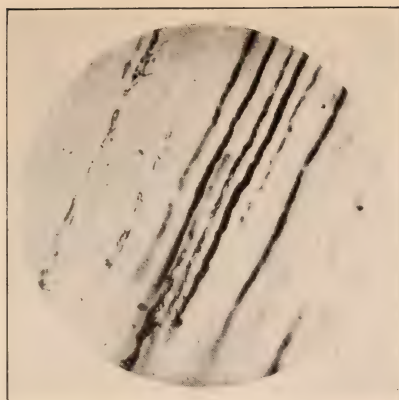


Fig. 1

Section of carious dentin, showing the microorganisms entering and following the dentinal tubules in the newly-decalcified zone. Miller demonstrated that decalcification of the dentin *precedes* invasion by microorganisms. This must have an important practical bearing on the question of the infection of the dentinal tubules in teeth with pulps destroyed—after Miller.

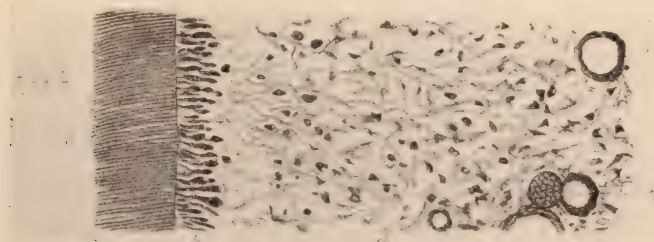


Fig. 2

Section of the peripheral part of the pulp, showing: a—the inner zone of dentin; b—the odontoblastic layer; d—the loosely arranged connective-tissue fibers and cells.—“Dental Microscopy,” Hopewell Smith.

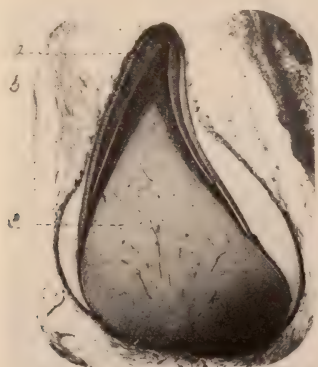


FIG. 3

Longitudinal section of a dental follicle of an anterior tooth, showing at a—the forming enamel; b—the dentin; c—the dentin papilla, which forms the dentin and is the forerunner of the dental pulp.



FIG. 4

Dissected jaws of a child about four years of age, showing deciduous teeth with apices formed and pulps encased. The permanent teeth are seen occupying crypts in the jaws and show various stages of development.

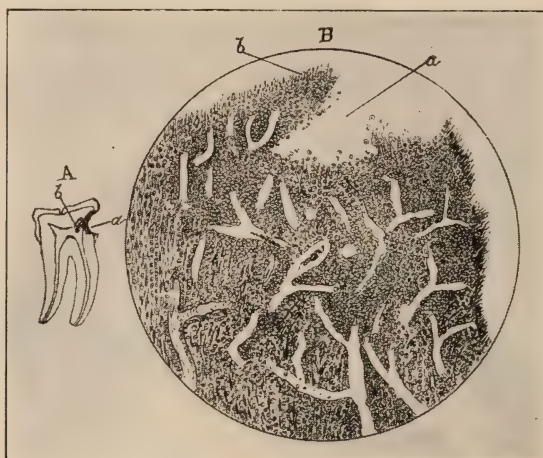


FIG. 5

Longitudinal section of a molar tooth showing cavity of decay encroaching the pulp. The infection destroyed the odontoblasts covering the pulp at their point of entrance, then attacked the deeper structure of the pulp hollowing out the tissue, and finally attacking the odontoblastic layer, which is the *last* of the pulp cells to be destroyed—after Black.



FIG. 6

Longitudinal section through the crown of a human molar, showing an occlusal cavity of decay. *p* indicates the pulp chamber, much constricted by secondary dentin, designated by S. D. The "zone of translucency" or "transparent zone of Tomes," is the lighter area circumscribing the decay and lying between it and the pulp cavity. This lighter area has undergone so-called tubular calcification or dentinification.—From Buchard after Gysi.

to assume that the tubular contents would be less attractive after the pulp is destroyed.

The fifth fact is: "Food substances taken into the mouth are of all classes, carbohydrates, fats and nitrogenous." Let us remind ourselves that only *one* of the three classes of food is directly involved in tooth decalcification. The *fats* are not decomposed or digested in the mouth or stomach. Nitrogenous foods, including albumins, such as meat, eggs, etc., ferment with an alkaline reaction, hence cannot directly aid in producing caries. Therefore the only class of food directly involved is the carbohydrates, which includes the sugars and starches. Even these do not act of themselves, but serve as soil for acid-forming microorganisms, which, in obtaining the food elements necessary for their existence and perpetuation, reject certain undesired elements, these combining to form the acids of caries.

If the sugars and starches are cleansed from the teeth within twenty minutes after their introduction, the teeth will not be harmed. The effect of diet upon the production of caries was convincingly shown by tables compiled by Mummery. He found that races consuming a meat and fish diet almost exclusively, as the Esquimaux, showed only about 3 per cent. of caries, while those using a mixed or a vegetable diet had from 10 to 40 per cent. of decay.

The *predisposing* causes of caries are divided into (a) local and (b) general.

The *local* causes are primarily tooth imperfections which make favorable places for the collection of food and the formation of bacterial plaques. These include faults of tooth form, arrangement and position. They embrace deep pits, sulci, fissures and flat proximal contacts and teeth out of proper position, all of which combine to create conditions that make difficult both natural and artificial cleansing. Exposed cementum, because of its greater roughness, favors lodgment of food and formation of plaques.

There are also other local predisposing causes that demand mention. These include acid medicines not properly administered, the acid vomitus of pregnancy and seasickness, which, if not neutralized with an antacid mouth wash, tend to roughen the sur-

faces, especially between the teeth, thus favoring the attachment of plaques. Certain of the fruit acids, if eaten in excess, also have a decalcifying action, resulting in a roughening of tooth surface. The secretion of the gum may become acid and roughen the tooth structures near the gum line, etc. In certain catarrhal conditions of the oral mucous membrane the saliva will become mucinous and ropy and entangle food particles and aid in their adherence to the teeth. Many cavities of decay will frequently have a like result.

General Predisposing Causes

Caries is much more prevalent in some mouths than others. Periods of comparative immunity may be established and followed by a period of susceptibility and again a succeeding immunity. Much speculation has been made as to the cause.

Until a few years ago it was commonly thought that so-called hard and soft tooth structure was primarily responsible. Many believed that the density of tooth structure varies in different conditions of health and attributed to this the periods of rapid and slow progress. G. V. Black in 1895 made known the result of analyses of so-called hard and soft teeth which led him to the opinion that density of tooth structure has nothing to do with the *inception of caries*. This statement does not mention the *progress* of tooth decay. He instances a case in which the enamel was chalky and cut almost as easily as a slate pencil and yet there was but little caries.

It is noticeable in practice that some teeth of poor structure and defective form do not readily decay.

These facts led G. V. Black to the conclusion that a period of marked tooth decay may be due to two factors:

(a) A temporary lack of oral hygiene—*i. e.*, the exciting cause being active.

(b) To some systemic condition which changes the constitution of the oral fluids to favor the formation of microbic plaques.

Time will permit only the briefest mention of a few of the most important factors.

Caries is commonly most intense before adult life. Michaels

claims that the saliva of adolescence favors the formation of lactic acid because of a dextrinic principle, glycogen, which make it susceptible of acid fermentation. Lack of proper home cleansing is probably also an important factor. Whatever the cause, the fact remains that if the teeth are properly and promptly filled and the patient well instructed in the care of the mouth, a period of comparative immunity is established. Therefore, the closest attention during youth is of utmost importance. Flagg tabulated the ages of susceptibility as follows: 5 to 8 years, 12 to 20, 30 to 35, 45 to 50, 60 to 65 and senility. The intervening years are periods of comparative immunity. This may serve as a general guide, but is, of course, subject to variance in different individuals. Certain *bodily* conditions, as pregnancy, typhoid, anemia, diabetes, etc., are frequently accompanied or followed by the development of caries. It has not been generally decided whether this is due directly to the disease or to a coincident lack of oral hygiene. If the mouth is well cleansed, the progress of the decay will be greatly limited.

Whatever the predisposing cause of caries, the following facts are of clinical importance:

(a) The exciting cause is the colonization of acid-forming microorganisms on the tooth surface.

(b) Caries begins only at uncleansed spots which are usually in areas protected from the cleansing process, and under favoring conditions plaques are formed. These are thin transparent films formed by the microorganisms. They are not observable with natural vision and are very difficult to detect even under magnification. Their presence was much in dispute until J. Leon Williams, by an improved technic, demonstrated their presence. They are quite tenacious and are entirely distinct from the soft, white decomposing material commonly seen on the tooth surfaces.

The progressive steps in caries of the crowns are:

(1) Nasmyth's membrane, when not previously removed, is disintegrated by the products of the bacteria. It may act as a breeding ground for many forms of microorganisms.

(2) The enamel surface is roughened and the rods become granular, due to the action of the acids.

(3) The acids produced attack the inorganic cement *between*

the rods, and also dissolve transversely the cement *between* the *globules* or calcospherites forming the individual rod. This unbinds the enamel globules and they are dissolved and washed away, leaving a shallow depression or superficial cavity in the enamel.

If not arrested the process repeats until the dentin is reached.

If the progress is slow the enamel may retain its form, the carious area becoming chalky and porous. The organisms may pass through this sponge-like track, which in most instances becomes discolored. Some little force is usually necessary at first, to break this down. This must not be confused with so-called "arrested decay."

(4) The dentin presents histologic and chemic variations from enamel, therefore the process differs correspondingly. Decalcification always precedes the invasion by bacteria. (See Fig. 1.) The organisms travel in the line of least resistance, which on reaching the dentin is usually laterally in the granular zone. They also enter the tubules and penetrate toward the pulp, producing a cone-shaped area with the base toward the enamel, the apex pointing pulpward.

Around the area of decalcified unaffected dentin, appears what is termed the "transparent zone," or "zone of translucency." This extends around the cone of carious dentin, forming between it and the pulp. (See Fig. 6.)

The organisms enter the tubules in the decalcified area and probably act upon the organic matrix of the walls. They multiply and the products of growth and nutrition cause the tubule walls at first to thicken. Later, the bacterial ferment, because of its peptonizing power, begins to liquefy the inner surface. Bacteria wedge into the acquired space. More acid is produced, the inter-tubular substance being invaded until several tubules are included, the intervening matrix having become liquefied and washed away forming a "liquefaction focus." Several of these coalesce and a cavity is the result. No matter what the predisposing cause, the exciting one will always be a bacteriologic problem. The microorganisms, to cause decalcification, must be in contact with the tooth so that their acid by-product, in a nascent state, may



FIG. 7

Longitudinal section of the crown of a human molar, showing in the light areas of dentin so-called tubular decalcification or dentinification. At a, it is caused by a fissure; b, by checks in the enamel; c, by wearing away of a part of the thickness of the enamel. Secondary dentin is shown at S. D. These protective changes have taken place without the consciousness of the individual.



FIG. 8

Longitudinal sections of the crowns of the human teeth, showing tubular calcification and secondary dentin, adjacent to the areas of irritation.

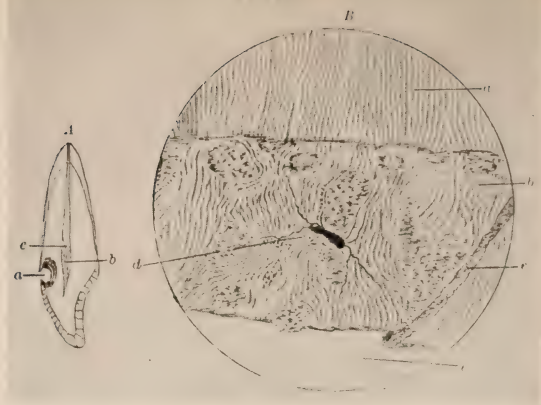


FIG. 9

Secondary dentin resulting from irritation of the dentinal fibrils by caries, A is a longitudinal section, showing at a the cavity of decay; b, the deposit of secondary dentin. B, illustration of the minute structure of the secondary dentin. a is the primary and b the secondary dentin.—After Black.



FIG. 10

Longitudinal section of an upper bicuspid showing *secondary* deposits in the pulp cavity, which would make proper cleansing and filling extremely difficult. These are the result of mild, long-continued pulp irritation.

act directly on its surface. The plaque, with which they invest and attach themselves to the tooth, affords the necessary protection.

A tooth that is kept clean and free from bacteria cannot decay. Antiseptics of a strength available without injury to the tissues of the mouth have failed to prevent the inception of caries.

The most effective treatment so far employed is that which is generally termed Oral Prophylaxis.

If unarrested, caries will continue until the pulp becomes involved.

Diseases of the Dental Pulp

There has never been a time in the history of dentistry when the importance of maintaining the dental pulp in a state of health has been so keenly appreciated as now.

Until very recently there were only a comparatively few, even of the leaders in dental pathology, who recognized fully the importance of *preventing* infection of the pulp cavity. But to-day, dentists, physicians and even the laity stand almost aghast at the far-reaching harm resulting from pulp death and its sequellæ. Therefore, it seems best that we consider rather more in detail this very important part of our subject.

From recent writings and society discussions, it is found that the most extreme diversity of opinion prevails among dentists. There are still those who advocate saving every tooth that may be made to feel comfortable and in contrast, there is appearing a class that believes that no tooth without a vital pulp should ever be retained. Both must be accorded sincerity. It would seem, however, that the wide difference of opinion would be considerably narrowed by a proper understanding of pulp function.

The dental pulp has two principal functions—(a) that of forming dentin, and (b) that of nourishing and rendering the dentin sensitive.

It is not a complete tissue in the essential meaning of the term. A *tissue* is an aggregation of similar cells and their derivatives, the intercellular substances. These elements, however, must be sufficiently formed and properly associated so that the organ which they comprise must have, not only a complex in-

ternal structure, but sufficient resistance to maintain a definite external form. This is not true of the tooth pulp. It exists as a soft mass much resembling embryonic tissue. The intercellular substance is a mucus-like matrix of modified protoplasm, containing some loosely arranged connective tissue fibres. This supports many cells which are not closely intermingled in the deeper structure, but which have always a definite space existing between them. On the surface, in contact with the dentin, the cells are much more numerous and form a comparatively continuous layer. (See Fig. 2.) These are the odontoblasts or cells which normally form the dentin. This soft, pulpy structure is encased within unyielding walls of dentin, which normally protect it completely from the impress of adjacent parts and irritating influences from without.

The forerunner of the pulp, the dentin papilla, is at first without this protecting wall. (See Fig. 3.) As it forms the dentin it encases itself, becoming progressively smaller as more dentin is formed. (See Fig. 4.) Were it not for this encrustment Nature would dispose of the papilla in a manner similar with the other formative structures of the body, that is, either removal by resorption after their duty of forming tissue is done, or by so modifying their physical characteristics as to enable them to withstand the comparatively rugged impress of contiguous parts. Neither occurs in the tooth pulp. It is a peculiarly modified structure and can exist only in its unique environment.

Closely associated with the structure and function of all organs is the circulation, that of the pulp presents notable peculiarities. It is richly supplied with blood vessels. These consist of a single layer of endothelial cells and some scattered longitudinal muscle fibers. Not possessing a complete wall of muscular tissue, they are not under the control of the vasomotor system of nerves. These vessels are in very close relation with those of the peridental membrane. The arteries enter at the apical foramina and soon break up into capillary networks, which are closely associated with the odontoblasts. The veins are numerous and anastomose freely. They pass out through the apical foramina and are quite probably continuous with those of the peri-

dental membrane. Here please note that the area of entrance for the arteries and exit for the veins is identical. The blood supply to the pulp, and venous *return from* it are through the same minute apical foramina. When from any cause the arteries are abnormally full, as, in arterial hyperemia, their expanded walls tend to compress the veins. This prevents the normal passage of blood from the pulp, resulting in its ready engorgement. When the blood pressure *within* becomes greater than that of the arteries at the *entrance*, the veins emerging at the apex begin to dilate, resulting in gradual compression of the arteries, with consequent diminution in the supply of nourishment to the pulp cells. Thus it is seen that food supply and the removal of waste and morbid products are very easily impaired and in extreme degree. Being encased in unyielding walls, great pressure is developed and much damage to tissue easily results. The intensity of pulp pain is due to the ready possibility of great pressure upon the nerve terminals.

From the foregoing study, if its correctness is conceded, it must be evident that disturbances of the dental pulp are more destructive than in tissues of the body in general. This is for three principal reasons:

- (1) It is not a perfect tissue formation.
- (2) It is encased within unyielding walls.
- (3) Peculiarities in the circulation.

There can be no sharply defined line of separation between diseases of the pulp and those of vital dentin. The pulp forms the dentin and the living matter which both nourishes and renders it sensitive, termed the dentinal fibrillæ, are simply attenuated extensions of the peripheral pulp cells. Therefore any disturbance of this living sensitive matter of dentin must produce irritation of the pulp proper in more or less marked degree.

For convenience, we shall consider the influences affecting the pulp, under two heads, (1) infection, and (2) thermal and other irritants.

Infection is the act or process incited by the entrance and proliferation there of harmful microorganisms. When microorganisms invade the dental pulp, they destroy the odontoblastic layer at the point of entrance, then prey upon the *deeper* structure, gradually destroying it, and finally returning toward the surface

cells or odontoblastic layer. Therefore the odontoblasts are the *last of the pulp cells to be destroyed*. (See Fig. 5.) Their attenuated processes form the dentinal fibrillæ which occupy the dentinal tubules. Dr. Noyes said at our last meeting that he defied anyone to remove all of the odontoblasts from the walls of the canals, and called attention to the important bearing this may have in limiting infection of the dentin from the pulp cavity. Dental caries is a condition produced as the result of bacterial action. As the destructive process advances, the pulp endeavors to protect itself against the invasion. This barrier may be formed in two ways: (a) by so-called calcification of the tubules, (b) secondary dentin. If the progress of decay is slow the pulp may have sufficient time to fortify considerably. If, however, the advance is rapid, this does not occur and irritation soon encroaches sufficiently to cause pain. On examination of this class of cavity, it will usually be found that caries has so far developed that very much or all of the dentin is decalcified, a part remaining as a soft leathery mass, so yielding that slight pressure with a blunt instrument or tightly rolled pellet of cotton will cause pain. If a layer of normal dentin remains, slight pressure will not bring painful response.

Decalcification precedes invasion by bacteria; therefore, if the pulp has been comfortable and all of the decay may be removed and still there remains a wall of normal dentin, even though quite thin, the pulp has not been infected and may be conserved by a proper filling of the cavity. If, however, the removal of all the decalcified dentin would expose the pulp, what shall be the treatment? Is it good practice to attempt to sterilize the leathery mass, and if at all possible to make the tooth comfortable under a test filling for ten days or a fortnight to replace with a permanent filling? Infection entering through the apical foramina is not an uncommon occurrence when the pulp has become degenerated. This will be considered in connection with the constructive diseases.

If the patient is so young that there is a doubt as to the completion of the roots, all possible effort should be made to retain the organ, even though infection has invaded a part of the bulbous portion. This involved area should be removed under

aseptic conditions and the remaining part most carefully protected from pressure and thermal irritants and judiciously sealed. At this age, the pulp is large, the circulation copious and the formative cells so active that even though slight pain occurs at times the chance for the complete formation of the root apex is good. In such cases removal of the pulp will usually be necessary a few years later, but if in the meantime the root has been fully formed, a most important result has been obtained.

If the patient be an adult, all carious tooth tissue should be removed, even though it means pulp exposure. This organ should be extirpated rather than sealed by a zone of dentin, softened and invaded by microorganisms. It is difficult to destroy all the bacteria and their spores in the leathery mass. Those remaining alive will die of starvation and become decomposed, producing poisonous products which are positively destructive to the pulp. It may take some little time for their absorption, but it must surely follow.

The second heading, *thermal and other irritants*, will include very slow progressing caries, chemic irritants, as sweet, sour, salt, etc., and thermal shocks.

If these are severe and have caused pulp pain which continues for ten to twenty minutes after the removal of the irritant and recurrence is frequent, say daily, and has existed for a week or ten days, the walls of the blood vessels will have become so altered in their structure that recovery of their tone is extremely doubtful. In adults, removal of the pulp seems best.

It is appreciated that normal dentin supplies something to enamel which sustains its integrity. This quality, however, seems to diminish and gradually disappear in the presence of crippled pulps.

When the irritants are mild and long continued, slow pulp degeneration occurs. The cause and effect are distinctly different from the foregoing.

A pulp is best and probably perfectly protected by normal dentin and unbroken enamel. Any modification of these structures, whether induced mechanically or chemically, results in reactionary efforts to protect itself. This occurs even though the alteration be so slight as a mere wearing away of part of the

thickness of the enamel or a fracture of it, even though not detectable by natural vision. From this it will be understood that the irritation exists before the condition is recognized either by patient or dentist. The *normal* pulp responds only to **thermal** changes. After exposure of the dentin it will react to any agent which will irritate the naked ends of the fibrillæ, as acids, sweets, mechanical means, etc. This occurs in abrasions, erosions, exposures of the necks of teeth, caries when of slow progress and beneath all filling and crowns placed on vital teeth.

The dentist, except in rare cases, does not become aware of the necessity for operative measures until the dentin is nearly or wholly exposed, at which time the pulp has begun to fortify itself against abnormal influences from without. It has been proved that no single filling material or combination of materials available can insulate the pulp of a tooth so well as perfect enamel and dentin, therefore all filling materials and crowns placed upon vital teeth permit of a continuance of shocks from heat and cold. These vary in degree from a mildness which is not noticed by the patient, to those which are so severe that unless the condition is very soon remedied, the pulp will undergo rapid degeneration and death. There should be the least removal of healthy tooth structure, especially toward the pulp, that is consistent with thorough work. All restorations upon vital teeth should be made with the thought of pulp protection uppermost in mind. Insulating materials of lowest conductivity and non-irritating qualities should be selected, and all metallic fillings should be veneers, approximating the thinness of the destroyed enamel as closely as strength will permit.

The *mild* irritants are worthy of special consideration. They continue to stimulate the pulp until changes have taken place which insulate to the degree which existed before the enamel and dentin were disturbed. When this state is reached, it ceases its formative action because the irritating influence is overcome. This is accomplished by a stimulation of the pulp to constructive activity, resulting in the formation of tubular calcification and secondary dentin, these serving as a barrier against destructive influences from without. There is a generally accepted and well-established rule that any influence which stimulates a formative

tissue to production beyond the typical demand, or, in other words, after it has had a period of physiologic rest, causes a degeneration of the tissue. This holds good of the dental pulp as it does of the other tissues of the body.

It is well known to all that secondary dentin and tubular calcification are necessary to the success of very many of the dental operations which we perform, especially in young patients. There is, however, a limit to the benefits to be derived from constructive changes in the pulp. This is due to a degeneration which occurs within its structure as a result of *much* secondary dentin formation. The degree of pulp decline depends upon the extent of secondary deposits.

The question, therefore, resolves itself to this: Where shall the border line be drawn between:

- (1) Secondary deposits which do not endanger pulp vitality.
- (2) Secondary deposits which do endanger pulp vitality.

Pathologists group secondary deposits into four principal classes:

- (a) Tubular calcification or dentinification.
- (b) Secondary dentin.
- (c) Pulp nodules.
- (d) Calcic degeneration of the pulp.

We shall consider in detail the first two only.

Tubular calcification includes the changes which take place in the walls of the dentinal tubules which lead to their constriction and obliteration. This area is known as "the zone of translucency" or "transparent zone of Tomes," and is situated between the area of irritation and the pulp. (See Fig. 6.) The exact process involved in its formation is not understood. Many believe it due to hypercalcification, others to decalcification. In either case it may be regarded as a physiologic barrier against pulp irritation. It causes no considerable change within the pulp.

Secondary dentin is a deposit of new dentin upon the walls of the pulp cavity after the typical demand of the tooth has been satisfied, or after the pulp has had a period of physiologic rest. It is caused by irritation, most commonly thermal, which produces over-stimulation of the formative cells of the pulp. (See Fig. 7.) As a result, the odontoblasts gradually degenerate and

if large masses of secondary deposit are formed they become obliterated, in which case the deeper cells of the pulp may take on the work of dentin formation. (See Figs. 8 and 9.) The pulp becomes more fibrous and less functional with advancing age. The products of degeneration increase. These are closely associated with those of the pericementum, therefore it is quite possible that this membrane may suffer in consequence.

If a pulp in a state of progressive degeneration be not removed, it becomes only a question of time until its nutritient supply and waste removal become so unbalanced that its death will occur either with or without infection. A cavity of decay is not necessary for infection of a pulp, the microorganisms may easily be conveyed to the part by the blood stream, in which case the sequellæ demand most serious attention. The prognosis in this condition is the most unfavorable of any dental lesion. This condition most favors metastasis. The tissues in the periapical area are practically always involved, many times, showing structural disturbance before complete pulp death has occurred. The fact that a sharp lancinating pain is produced by extremes of temperature or by the galvanic test, is not an indication that the pulp is *healthy*. In fact, a diseased pulp is, as a rule, the more responsive both in the onset and duration of the pain.

Much secondary dentin greatly modifies the size and form of the pulp cavity, especially the root canals. These tend to become constricted and oftentimes tortuous. Associated with this slow degeneration is often found the formation of pulp nodules and cylindric calcification of the pulp. (See Fig. 10.) This condition may be productive of neuralgia. All of these secondary formations tend to greatly complicate the proper cleansing and filling of the pulp cavity. Therefore when the existence of the causes of pulp degeneration become evident, extirpation of the organ seems imperative for three principal reasons:

First: The harm that may result in contiguous soft tissue especially the peridental membrane, before pulp removal.

Second: The danger of metastasis.

Third: Because of the increase in the physical difficulties of successful root treatment.

In consideration of these facts, is it good practice to leave

pulps in teeth upon which operative measures are necessary, in cases:

First: When decay has so progressed that all of the overlying dentin is decalcified (except in young subjects)?

Second: When prolonged pulpitis occurs beneath fillings, especially of gold, of some years standing?

Third: When operative measures are necessary upon teeth either much abraded or deeply eroded?

Fourth: When much dentin has to be removed in elongated or inclining teeth in preparation for shell crowns, especially metallic?

Fifth: In facial neuralgia when associated with or superinduced by pulp degeneration?

The normal relationship of the root of a tooth in its socket is of vastly greater importance than the vitality of the pulp and dentin.

Dental practice everywhere has always borne convincing proof that a tooth from which a non-infected pulp has been removed under aseptic precautions and the pulp cavity properly filled, is capable of remaining healthy and of doing efficient service for decades. In contrast to this there is growing in the minds of foremost pathologists a grave doubt as to whether it is possible, without tooth removal, to make sterile the periapical area in which tissue has been destroyed by infection.

From the foregoing study it would seem that there can be but one conclusion, and that is: When the conditions which favor pulp degeneration are known to be present, that the pulp cavity be properly cleansed and filled *before* it has become deeply infected and while physical conditions favor thorough work.

By way of review, permit me to direct your attention to the following conclusions:

(1) That the *normal in function* and *minute structure* is the basis of pathology.

(2) That the oral cavity is an integral part of the economy contributing to its health and disease, and is in turn affected by the health and disease of the other parts of the body.

(3) That normal occlusion is the basis of the practice of dentistry.

(4) That the proper care of the deciduous teeth is equal in importance to that of the so-called permanent set and that they perform an important work in the development of the jaws, the cranium and the body as a whole.

(5) That every restorative operation should be based upon the principles of normal occlusion and harmonized with the conditions present.

(6) That traumatic occlusion and improper dental restorations are the most potent factor in destruction of the supporting structures of the teeth.

(7) That a clean tooth, free from bacterial growth, cannot decay, and that so-called oral prophylaxis is the most efficient treatment for dental caries so far known.

(8) That all restorations in vital teeth must be made with the thought of maximum pulp conservation and upon the principle that the old age tendency of the pulp is one of decline.

(9) That when the influences which hasten serious pulp degeneration exist, it is the best practice properly to cleanse and fill the pulp cavity *before* it becomes deeply infected and while physical conditions favor thorough work.

CHEMICAL STUDIES OF THE RELATIONS OF ORAL MICROÖRGANISMS TO DENTAL CARIES¹

BY WILLIAM J. GIES AND COLLABORATORS.

7. Remarks on the recent findings and publications of other investigators in this field.²

By I. J. KLIGLER

(From the Biochemical Laboratory of the Schools of Medicine and Dentistry, of Columbia University, at the College of Physicians and Surgeons, New York.)

FEW circumstances are more delightful to an investigator than the observation that his work excites the interest of others and that his results are confirmed by those who cover the same or contiguous territory. We have lately experienced very great gratification of this kind from reading recent papers by Meyer,³ by Howe and Gillette,⁴ and by Howe and Hatch,⁵ on the micro-organisms of dental caries.

Readers of this journal, and members of the First District Dental Society, may recall the fact that of the six preceding papers in this series, we⁶ published three that constituted, in effect, an historical and experimental re-examination and extension of available knowledge, both qualitative and quantitative, pertaining to oral bacteria in their relations to the teeth.⁷

¹ Gies and Collaborators: *Journal of the Allied Dental Societies*, 1915, x. (1) p. 137, (2) p. 141, (3) p. 282, (4) p. 445, (5) p. 459, (6) p. 464.

² This is the second portion of the senior author's annual report to the First District Dental Society of the State of New York for the year 1917. The first portion of the report for this year was published by Franke and Gies: *Journal of the Allied Dental Societies*, 1917, xii, p. 360.

³ Meyer: *Journal of the National Dental Association*, 1917, iv, p. 966.

⁴ Howe and Gillette: *Ibid.*, p. 997.

⁵ Howe "assisted by" Hatch: *Journal of Medical Research*, 1917, xxxvi, p. 481; reprinted in *Dental Cosmos*, 1917, lix, p. 961.

⁶ Kligler and Gies: *Journal of the Allied Dental Societies*, 1915, x, pp. 141, 282 and 445. The remaining three papers in the series, by the senior author and collaborators, are referred to in footnote 1, above.

⁷ These three papers were sections of the senior author's annual report to the First District Dental Society of the State of New York for 1914-15. See footnote 1, above. The printed report for 1915-16 in this series has not yet appeared; it will be published by Kramer and Gies in the next issue of this JOURNAL.

Regarding the outcome and significance of this work, Meyer has written, in part, as follows (*loc. cit.*, p. 978).

"The results presented by Kligler, and so ably correlated under the guidance of Gies, permit of some (general) deductions, namely: The bacterial flora of the buccal cavity is acid-producing or saccharolytic to a moderate degree. [There is, on an average, a higher degree of acidity of the saliva to phenolphthalein in caries than in immunity to this condition (Shepard and Gies, Sieberth, Baumgartner, and the German School, etc.)]. The cocci are partially responsible for this condition; that these organisms are, however, the important agents of caries—a view advanced by Goadby and the German School—is disproven by the quantitative studies of Kligler. In comparison with the clean and normal mouth, there is a decrease of the streptococci in all stages of decay and a marked increase in the acidific bacilli."⁸

"There are three types which, either alone or in association, are suspected of bringing about decay; they are the *B. acidophilus* (Moro), *Cladothrix placoides* and the *Leptothrix buccalis*." (p. 977).

Meyer states that he regards our contributions to dental bacteriology, made under the auspices of your Society, as fundamental, instructive, and clarifying. Howe and Hatch, however, while corroborating our results so far as their work extended, refer to our papers indifferently as elements in, and contributors to, the prevailing confusion and uncertainty in this field, and then wholly refrain from stating or suggesting, even in their summary of conclusions, that their findings support our own and invalidate none of them.

The present paper is intended particularly to call attention to the anomalous situation thus created by Howe and Hatch, and to correct the impression produced by their paper.

The paper by Howe and Hatch also contains other inaccuracies which we wish to correct. These authors express the erroneous opinion that they have recorded observations, and discovered relationships, of special importance that have not been

⁸ The senior author adds the following from Dr. Meyer's paper, for the pleasure it gives him personally to note the appreciation in which his collaborator's work in this connection is held by Dr. Meyer: "Kligler's work . . . is to be considered the basic groundwork on which all further studies have to be built (p. 974) . . . The publications of Kligler are so extensive, so instructive, and so suggestive, that it is practically impossible to enumerate in this (Meyer's) review all the phases which are of general interest" (p. 976).

Although the foregoing is the expert opinion of Dr. Meyer, himself a bacteriologist, regarding the efficiency and adequacy of the up-to-date bacteriological work done by Dr. Kligler, in his collaboration with the senior author in our research in this field, Howe and Hatch open their paper with this surprising assertion: "The literature upon the mycology of the mouth is voluminous, yet it contains no work upon dental caries that meets modern bacteriological requirements." W. J. G.

noted before. They also state conclusions which do not appear to be wholly justified by the results obtained with their questionable procedure. Howe and Hatch seem to forget that progress in science requires accuracy of statement as well as caution and earnestness in the interpretation of experimental data.

Howe and Hatch are correct in stating, at the end of their introduction, that "there is no agreement in the bacteriological findings of the various workers." They create, however, a decidedly wrong impression when they sum up our results as follows (*loc. cit.*, p. 482):

"In caries he ('Kleigler') believes that the oral flora changes its character from a streptococcal to an acid-producing rod and a thread flora. He believes that in caries there is a large numerical increase in the oral microorganisms, but that the types actually concerned in the carious process are relatively few.

"He describes *B. mesentericus*, *B. putrificus*, *B. acidophilus* (Moro), a non-pleomorphic beaded bacillus, a leptothrix which he believes he has cultivated, and *Cladothrix placoides*."

The above statement is correct as far as it goes but, as a summary of our results, it is not only inadequate but also inaccurate. The last sentence conveys the impression that all these types (as enumerated by Howe and Hatch) were considered by us as "actually concerned in the carious process." We fail to find any statement in our papers which would suggest in the remotest way that *B. mesentericus* or *B. putrificus* is considered by us to be concerned in primary decay. On the other hand, the facts as stated by us give an entirely different conception of our ideas regarding the organisms that are involved in the carious process, as the following quotations show.⁹

"A totally different conclusion results from a correlation of the data obtained from a study of *diseased* teeth. Here, too, there is a decided difference in the total numbers of bacteria present at the different stages or degrees of decay. Associated with this difference there is, however, not only a complete change in the character of the flora and the relative prevalence of types from that of the healthy teeth; but there is also a *distinct difference between the types of bacteria in the early stages and those in the later periods of decay.*

"*Primary caries* may, from the enormous counts and from the changed character of the prevailing flora, be considered a specific infection in which a *limited number of types (perhaps three) are concerned.* Just what is the predisposing factor or which of these types is most in-

⁹ Kleigler and Gies: *Loc. cit.*, p. 312.

strumental in bringing about decay, or whether we do not deal here with a true association of types, is hard to say. *The significant facts are the (a) marked increase in the acidific bacilli, some of which are capable of producing and resisting an acidity of 8 per cent. N acid, and the (b) accompanying numerical increase in the long and short thread-forms, which can readily attach themselves in the form of compact colonies to any surface. One type of pleomorphic short thread-forming organism, growing in comparatively large colonies, has been observed regularly to attach itself to solid glass surfaces, and to the wall of the test tube in liquid cultures, while in plate colonies it was often found enclosing one or two colonies of other bacteria. This type is relatively abundant in carious teeth. The relation this organism may bear to the concentration on a small area of a large number of active acid-producing rods is suggestive to say the least.*"

Again, quoting from our second paper (*loc cit.*, p. 313):

"For the present it is clear that the early stages of caries are bacteriologically due to one and the same process, characterized by a great increase in the total number of bacteria, accompanied by a drop in the relative number of cocci, and a *marked increase in the number of acidific bacilli and thread-forming organisms.*

"Goadby has observed the presence, in almost pure cultures, of an organism, from the deep layers of dentin, closely resembling the acidific bacillus and named by him *B. necrodentalis*; but he never associated decay of enamel and dentin with this form."

We differentiated primary caries or enamel decay from that of pulp decay, as is evidenced by the following statement from our second paper (*loc. cit.*, p. 313):

"Decay of the pulp, as noted from a correlation of the results in group 9, is a process that is different in character from decay of enamel and dentin. Associated in this process are a (a) relatively low bacterial count, a (b) drop in the relative number of cocci, similar to that found in primary decay but differing from the latter also in showing a disappearance of the thread-forms, and the (c) presence in all cases of anerobic putrefying bacilli."

The distinctions between the two processes, and the organisms found to be associated with each, were also concisely stated in our summary of general conclusions (*loc cit.*, pp. 457-8) as follows:

"3. The early stages of caries are characterized by a decided alteration in the relative abundance of types as they occur in deposits on normal teeth. *Three forms, the B. acidophilus, the C. placoides, and the L. buccalis, were prominent in the carious enamel deposits.*

"4. In pulp decay an anerobic, spore-bearing, putrefactive bacillus, *B. putrificus*, was always prominent.

"5. The organisms prevalent in *primary enamel decay very actively ferment the common sugars and bring about comparatively great dissolution of powdered tooth*. The organisms in deposits on normal teeth and in the later stages of caries exert either slight effects, or none at all, in these relations."

The senior author, in further discussion of our findings, wrote as follows:¹⁰

"Although a relatively large number of definite types have been identified, classified and studied, numerous additional forms will require detailed attention. We believe we have merely peeped into a room full of many interesting and important exhibits.

"This 'peep into a room full of many interesting and important exhibits' revealed the presence there of three conspicuous bacterial forms of special interest: *Cladothrix placoides*, *Leptothrix buccalis* and *Bacillus acidophilus*. These three types were particularly prominent in material from cavities in superficial enamel decay. We have provisionally regarded two of these three forms (*C. placoides* and *B. acidophilus*) as possibly *directly* responsible factors, individually or together, in an infection that is productive of the *initial* stage of dental caries. (That coccus forms are vanguards in this attack is a possibility we have not excluded.) These types (*C. placoides* and *B. acidophilus*) grow vigorously in each other's presence, are actively fermentive in power, are capable of producing relatively large amounts of dentally destructive acid from the common sugars in ordinary culture media ('acidific'), and obviously can withstand the action of comparatively large proportions of the acid products of their own individual and associative fermentive activity ('acidophilic')."

There can be no doubt, then, that we found that three types (and considered particularly those three) were associated with, or prominent in, carious teeth. It is also clear that the acidophilus form, found regularly by Howe and Hatch, has been emphasized by us as one of the three types probably concerned in the carious process. In fact, if our review of the literature has been as thorough as we tried to make it, we were the first students of this subject to regard *B. acidophilus* (Moro) as probably a particularly significant member of the flora of carious teeth.¹¹ Meyer alludes to this fact; Howe and Hatch wholly overlook it.

¹⁰ Gies: *Loc. cit.*, p. 468.

¹¹ We make this suggestion with the reservation that possibly Goadby's *B. necrodentalis* was in reality *B. acidophilus*, although Goadby did not associate *B. necrodentalis* with any of the early stages of caries, having found this organism in the "deep layers" of carious dentin. Meyer, commenting on this matter, has said (*loc. cit.*, p. 973) that "Kligler . . . is the first writer on mouth bacteria who recognized the *B. acidophilus* (Moro) as a very important micro-organism of the buccal cavity."—W. J. G.

Howe and Hatch also claim that previous workers paid no attention to the pleomorphism of organisms found in carious teeth. "Indeed," they say, "the complete lack of attention it (pleomorphism) has received has obscured the *whole of the bacteriological work heretofore done upon dental caries.*" (*Loc. cit.*, p. 488.)

The following quotation from our second paper (*loc. cit.*, p. 303) should have made such an erroneous statement impossible:

"More than such a broad sub-division cannot be obtained on a purely morphological basis, with a flora so highly variable as that of the mouth. Some of the types of the trichomycetes are so puzzling that under certain conditions they would readily pass as cocci, under others as diphtheroids and under still others as threads. It is no wonder that Vincentini at one time claimed that these organisms were the progenitors of all other members of the oral flora. There can be no doubt that they contribute greatly to the marked variability of the microscopic appearance of that flora. Another type, a bacillus, varies in morphology from a short, thin rod of about 2 to 3 μ in length, to long rods and very long threads. Some of these were re-plated several times to determine whether they were pure cultures.

"With these facts on the *pleomorphic character of oral bacteria in mind*, we can readily see *how little reliance may be placed on studies based solely on morphological examinations*; and how much significance may be attached to named species seen only in pictures."

Viewed in its proper perspective, the paper by Howe and Hatch is interesting and instructive. It is regrettable that the oversights referred to should mar a valuable contribution to our knowledge of the flora of dental caries.

By using a technique different from ours, the authors have shown the predominance of the acidophilus type of bacilli in the cavities in carious teeth—a direct confirmation of our original findings in this regard.

The conclusion by Howe and Hatch, that "the Moro-Tissier group of microorganisms is *the* constant and predominant flora of dental caries, appears to be unwarranted. The technique used by Howe and Hatch to obtain the results that support this conclusion is *essentially an excluding one*—a technique that selects the hardier organisms that are able most effectively to resist the imposed hostile conditions, or, as the authors put it, "the more sturdy and vigorous flora intimately associated with caries." In

their first series of experiments, Howe and Hatch applied an "inert" filling for a period of six months, then removed the filling and examined the flora underneath. The effect of this procedure is indicated by the fact that in 10 of 27 instances no bacterial growth was obtained. In their second series of experiments, Howe and Hatch intensified the exclusion process by using an *antiseptic* filling. In the third series of their experiments (18 cases), Howe and Hatch prepared cultures direct from "the open carious tooth" and then obtained other types of organisms than the acidific, but did not clearly indicate the relative abundance of the types identified. It is obvious, therefore, that the object of Howe and Hatch, in these experiments, was to limit the surviving flora to what they designate as the "more sturdy and vigorous types."

That Howe and Hatch obtained the more "sturdy" types is quite probable, but that the sturdy types are collectively *the one* or *the only one* group "intimately associated with caries" is open to question. Our work revealed three types, but the evidence adduced did not justify the positive conclusion that any one, or two, or all collectively, were *causatively associated with caries*. We distinguished sharply between a conclusion and a belief to this effect.¹²

It is true that in caries it would be difficult, and perhaps even impossible, to fulfill all of Koch's postulates. But just because it is difficult to prove definitely causal relationships, one should be particularly careful and accurate in drawing conclusions. Our own evidence comes nearer to meeting Koch's requirements than does that of Howe and Hatch. We showed (1) that the acidophilic and placoides forms were practically absent from the deposits on normal healthy teeth; (2) that these forms appeared in the early stages of decay and were present in all cases of enamel and dentin decay (postulates 1 and 2); (3) that they

¹² In the last preceding paper in this series it was said, in this relation (Gies: *loc. cit.*, p. 468):

"We believe that, so far as we have been able to proceed, the results of this study are accurate, but the observations must be repeated and very widely extended before the data can be regarded as conclusive. The variables in such work are very numerous, and the personal equation itself is a factor of greater unavoidable uncertainty in bacteriological research than in investigations that are either purely physical or strictly chemical. We are disinclined, therefore, to attach undue importance either to our differential or to our mathematical data, and await the accumulation of the results of our further work, *by repetition and extension*, before attributing to our present findings an *unmistakable significance*."

readily dissolved powdered teeth, in test tubes, in a relatively short time. (In a sense this result meets the requirements of Koch's third postulate, but can hardly be accepted as a valid substitute for the results of direct animal tests). Yet we considered that no *conclusion* concerning causal relationship was justified. Although we indicated in the course of the discussion our belief in *probable* relationships, we scrupulously refrained from assuming that such a connection had been *established*. Howe and Hatch have been less conservative. We do not question the possibility that the acidophilic bacteria are the sole initiators of the carious process. In fact, we have considered it quite possible, just as we have considered other possibilities. We do assert, however, that such specific relationship has not yet been shown by anybody.

The paper by Howe and Hatch was received by the editor for publication last April. In the paper by Howe and Gillette (*loc. cit.*), published last September, which followed the one by Meyer to which we have already alluded, Dr. Howe wrote in his introduction as follows:

"The results of this investigation support the study and ideas of Dr. Klinger,¹³ who says that in caries the character of the oral flora is changed from a streptococcal to an acid rod and thread flora. These results are also supplementary to our other studies (Howe and Hatch) upon the bacteriology of dental caries in which we have shown that the prevailing flora consists of the highly aciduric microorganisms of the Moro-Tissier type."

Our ideas on the concluding sentence of this quotation are conveyed above in the comment on similar remarks in the paper by Howe and Hatch.

We cordially endorse the following statement by Meyer (*loc. cit.*, p. 975), which expresses the sentiments we have been voicing from the beginning of our study of the bacteriology of dental caries:

"In closing this section of this review (Meyer's) it is of importance to emphasize that only repeated investigations will reveal the true significance of the oral microorganisms, and that we certainly have not as yet completely succeeded in isolating all the organisms seen microscopically in the buccal cavity."

¹³ In the paper by Howe and Hatch, Klinger is referred to as "Kleigler." In the paper by Howe and Gillette, Klinger is referred to variously as "Klinger," "Kliger" and Kligler. The senior author was not so unfortunate—his name was wholly ignored by Dr. Howe in each paper.

PRESIDENT'S ADDRESS¹

MASSACHUSETTS DENTAL SOCIETY

By HAROLD H. CLEAVELAND, D.M.D., Springfield, Mass.

IN this short address there is no attempt to present something big. Too frequently we men step over, and ignore the detail which makes for perfection, in our eagerness to do something that feeds our ambition and wins applause from the onlooker.

Some twenty years ago I heard Dr. Russell Conwell of Philadelphia give his famous lecture, "Acres of Diamonds," a lecture so popular that he has presented it to delighted audiences more than five thousand times. I well remember one of the stories he told of a man in South Africa who sold his farm that he might go to Alaska to dig gold. Whether he found it I do not remember, but the man who bought the farm, while following the plow, kicked up a pebble which he examined, and to his amazement discovered that he held in his hand a rough, but unusually good diamond. Further search proved that the farm purchase had brought him literally acres of diamonds.

Many business and professional men are tempted to go to the Klondike to dig gold. It takes a man well qualified and educated and trained, and who loves his work, to see clearly that his particular business or profession is the best game in the world to win. He needs just a touch of imagination to see the necessity for a strict diet, good hours, and trained mind and muscles, to prepare him to meet and overcome obstacles which he must consider as cleverly executed plays of a skilful opponent.

By authorities we are told that man is only 10 per cent. efficient. But these same authorities tell us that with so many sources of information open and free to the seekers after knowledge, the efficiency might be increased 20 or 30 per cent., provided the man plays the game hard, plays it fair and plays to win. If you owned stock that was paying 10 per cent., and you knew it could be made to pay 20 or 30 and the property improved at the

¹ Read at 53rd Annual Meeting, Springfield, Mass., May 3rd, 4th, 5th, 1917.

same time, would you think it worth doing? That is the possibility we have.

The advance of dentistry has been very rapid in these last few years, and such men as Miller, Black, Prinz, Howe and many others have made it possible by freely giving time and energy to us who will show our appreciation of them as we did of Bonwill, after he had gone.

These men and our dental colleges have made American dentistry the standard of the world, but how are you and I to train ourselves to put into practical operation what they have discovered for us? May we not well take a leaf out of experience in business life?

Representing a modern manufacturing concern like the National Cash Register Company is no longer the simple matter of applying for a job as drummer on the road and drawing expense money.

Modern business has found that no detail is too small for consideration in selecting its representative, and the man is trained in the factory to know the product from the raw material in the mines, fields or forests through all the mechanical or chemical changes to the finished product, and at the same time he spends some hours each week in the firm's school of salesmanship, where he studies and develops his own personality and is taught to analyze the workings of the human mind.

Business has solved problems that to the usual professional man are still closed books. Business has taken psychology down from the dusty shelf and made it the foundation upon which every man must build the successful conduct of his business or profession.

Is it unethical for you to conduct your practice in a business-like and orderly manner? I do not remember having heard the celebrated Mayo Brothers of Rochester, Minnesota, criticised for conducting what is said to be the most business-like and orderly hospital in the United States.

Would not the young men who enter our dental colleges have a quicker grasp of the vital points of the course if they spent the first summer vacation selling books as a means of gaining first hand knowledge of human nature? And to gain an experience,

in the ethics of good business, which includes courtesy and service, where could they better go for the second summer than into the Marshall Field store in Chicago?

This training, however gained, would give the professional man a better judgment of values and he would better serve those who give him their confidence. The man or woman of the present day who comes to you for dental service is far more intelligent and observing than you have given him or her credit for, and you should grasp every possibility of extending our influence for good in the community.

The dentist has been overworked in these later years by the responsibilities placed on him by the X-ray, by ionization, by opsonic indexes and many other indications of changing conditions. He is such a very tired and sick man that at this meeting there will be held a consultation of specialists who will attempt to diagnose and suggest treatment and a mode of living which, if followed, will make the dentist a vigorous, successful servant of humanity.

Mr. Gilbreth, the efficiency expert, knows that the dentist has been exercising too violently in his office, and he will suggest reducing the number of false motions which will give the dentist greater efficiency with less burning of energy, so that at the end of the day's work there will be less mental and physical fatigue.

Mr. Forstbauer, the efficient office and equipment man, will rearrange the working conditions of waiting room, operating room and operating light, and laboratory, so that the dentist can do his day's work with ease and go out into the country at 4:30 in the afternoon instead of staying in the office until after all the babies are asleep in bed at home.

Mr. Kirschner, an expert accountant, is going to open a new set of books and show the dentist that by paying his bills promptly his credit is better.

He must protect himself and family by health, accident and life insurance, for there must be a business side to a professional man's life.

Mr. Anderson, a good student of psychology, believes the dentist may properly apply certain principles that will make it

possible for him to do a greater and better work and secure the intelligent coöperation of patients.

Dr. Kent will tell the dentist how he may exemplify the Spirit of Service, and teach proper mouth hygiene and practice preventive dentistry in the free dental clinic for the children, where 80 per cent. of dental defects, commonly found, may be prevented.

All of these papers are inter-related and equally important to the man who would stand high in his profession.

With reason, we might well follow the example of Baron Rothschild, head of one of the greatest European banking houses in the world, who made an iron-clad rule that he would associate only with successful men.

It is customary for the retiring president to make suggestions for the further conduct of the society, built on his observations and experience.

It is my belief that as an organization we have vast possibilities for valuable work for our members and for the people of our state, that have in no way been attempted. Or, to state it more plainly, we have followed a rut of our own making which has grown so deep that we have come to consider it the natural and only channel, but which, in reality, is not worthy of a body of men and women numbering more than nine hundred, organized and incorporated under the laws of Massachusetts, to cultivate a knowledge of oral science and its collateral branches, and the dissemination of all knowledge thus acquired.

Each year at our annual meeting we must continue to present, through essays and clinics, the best that dentistry has produced, but it is in other ways that our activities may be extended in organized effort to produce results impossible for the individual.

Having a meeting once each year is very much like having religion only on Sunday. A way of keeping the members throughout the state in closer relation with the parent society seems to be solved by the Illinois State Society through a bulletin issued each month to the members. I can think of nothing more stimulating to activity of the officers than the necessity for keeping work in

motion so that progress may be published at certain intervals during the year.

It should be the duty of the officers to have an intimate knowledge of the conduct of affairs in the several districts and to be prepared to suggest the names of speakers or other forms of entertainment to keep up the interest.

Our Committee on Dental Education could be instructed to prepare during the year educational articles on mouth hygiene and what we are doing and why we are doing it, which might and would be published gladly by nearly every newspaper in the state. This suggestion may receive criticism. Our own work each day trains the hand, and we have been content to let our work speak for us. If educational work is done through publicity in the public print, it will be less than a year before the intelligent people of our communities will show by their conversation, in your offices and in mine, that they are eager for instruction in preventive dentistry. A few years of activity along these lines should result in a great increase in our membership and a coöperation of layman and dentist which would remove much of the strain which now saps our energy in our daily work. This work might demand an increase in our society dues, but it would be worth far more than the outlay.

25 Harrison Ave., Springfield, Mass.

DENTAL CONDITIONS IN THE NAVY¹

By DR. C. H. MORRIS,

Assistant Dental Surgeon, U. S. N.

To the President and Members of the Massachusetts Dental Society:

IN response to your invitation, directed to the Commandant of the U. S. Navy Yard at Boston, I have been nominated to address you for a few minutes this evening on the subject of "Dental Conditions in the Navy." This is a broad and comprehensive subject, and I regret I cannot speak from a wider experience, and that certain statistics, much desired, are not available at present.

It is a common belief that the Federal authorities are very slow to adopt any new departure, and that is conditionally so; but once the Departments become convinced that a certain end can be attained, the suggestion will be adopted and provision made with a bounteous hand.

Dental conditions anywhere depend upon two factors:

First—The personnel.

Second—The remedial provision and its application.

Admitting this to be so—may we consider first of just what the human element in the Navy consists. According to a statement prepared by the Committee on Public Information and submitted by Chairman Dent of the House Military Committee, to the House of Representatives, for publication in the Congressional Record, there were in the Navy on Sept. 6, 1917, 141,867 enlisted men, 41,473 Naval Reserves, 14,500 Naval Militia, 5,000 Coast Guards, and 6,500 Hospital Corps, making a total of 209,340 men.

The enlisted strength of the Marine Corps, also a department of the Navy, was 29,981; reserves in the service, 1,070; National Naval Volunteers, 704; retired men on active duty, 14.

¹ Read at meeting of the Metropolitan District of the Massachusetts Dental Society, Hotel Thorndike, Boston, October 8th, 1917.

There were approximately 12,000 officers in the Navy and 1,166 in the Marine Corps. In other words, on that date the U. S. Navy had a total armed strength of 254,265 men, all of whom were volunteers, and these are our patients.

It may be well to remember right here that before being accepted and enrolled in the U. S. Navy, each and every man of this two hundred and fifty-four thousand has been subjected to a most thorough physical examination by means of which the weakling, the defective and diseased or otherwise unfit individual has been eliminated. And what is the result?

Simply this: That this two hundred and fifty thousand, together with the 820-odd thousand men now enrolled in the United States Army, constitute the very flower of American physical manhood.

You may be surprised to learn that in the First Naval District alone, out of a total of nearly 4,000 men examined for the Navy during the quarter ending June 30, 1917, only 84 were rejected because of defective teeth. Yet the figures are somewhat misleading, as many others included in the *total* rejection of 565, might have been rejected for dental reasons had they not been already refused for other causes before the inspection of their teeth was made—this examination, coming in the regular order, being fairly well down the list of requirements.

The Naval Regulations require that each man must have at least 20 sound teeth, of which four molars and four incisors must be occluding. This is no mean equipment, as you may realize if you stop to think that after eliminating the eight necessarily occluding, twelve other sound and serviceable teeth must be found in their proper places in the dental arch. Naturally, there can be but one answer to these figures, and that is, that this remarkable aggregation, wonderfully developed physically, constitutes a navy comprised of the finest body of men in the world. And, believe me, the dental conditions as revealed by an examination of many mouths is of a very high standard.

However, as dentists, the question of greatest interest to us is, what is being done to save the teeth of these men, and with what results. Suppose we consider the Navy as a great machine of which each individual is an important part, and where every

man has his own duty to perform. It is obvious that personal efficiency must be the aim of all, and in so far as a man suffers discomfort, just so far he becomes inefficient. Consequently, without regard to such humane and benevolent motives as may actuate our great department, the main thought and real motive is fitness. Every man must be fit when he enlists and keep fit throughout his term of service. The Naval Regulations provide that there shall be one dental surgeon appointed for each 1,000 of the personnel of the Navy; and that his services shall be available without charge to both officers and enlisted men and members of the Marine Corps, Naval Reserve, and in fact *all* who may be enrolled on the active list of the U. S. Navy. The Regulation further provides for a modern equipment consisting of a hydraulic chair, pressed steel cabinet, Allen bracket, electric engine of latest type, fountain spittoon, sterilizer, forceps, hand instruments of every description, burs without number, and in fact about everything a reasonable and up-to-date practitioner could ask for the satisfactory practice of dentistry, considering, however, that he is limited to the treatment of pathological conditions of the oral cavity and the insertion of plastic fillings.

The annual report of the Surgeon General for the fiscal year of 1916 states: "The Dental Corps is a new experiment in the Navy, and its usefulness will be better demonstrated as time goes on and when its influence upon the personnel of the Navy has had time to accumulate." And it was during *that* year that the Dental Corps was completely reorganized, and placed as "near as practicable on the same basis as that of the Army. The new act provides for one dentist for each 1,000 of the enlisted men of the Navy and Marine Corps, and graded promotion up to the rank of Lieutenant Commander after twenty years of service. It is to be taken for granted that many are familiar with the early work of the corps, and it may suffice to say that even during the *experimental* year of 1915 a total of 91,651 operations were performed, one of the items of which is 33,895 fillings. (1) 5,820 pulps extirpated. (2) 7,537 root canals filled, and 7,634 cases of calculus removed, shows how painstakingly the work was done. It is to be regretted that the figures for the year of 1916 are not at this time available. However, so successful has the "Experiment"

been found, that the full Naval Complement of Dental Surgeons is being enrolled as rapidly as possible; and so tremendously has the demand for dental service increased, that every large ship will soon include a dental officer in its rating, while at the larger Navy Yards and stations where necessarily the most active work must be accomplished, two, three, and in some instances even a larger number of dental surgeons are literally swamped by appreciative patients.

It is probable that the demands upon the dental office in Charlestown Navy Yard are proportionately similar to the demands upon dental establishments at Naval Stations throughout the world.

It would be a personal pleasure to myself if I could present to you, somewhat in detail, an outline of our daily routine at the Charlestown Navy Yard. You will be surprised to know that the floating population of the Yard is from twelve to fourteen thousand men, employed for the most part within the walls of about 200 buildings, of various sizes, or quartered aboard the many ships which are moored alongside the numerous piers. About two-thirds of this number are civilians for whom we perform but *little* service, and that of an emergency nature only.

Dentistry in the Navy Yard is, in many respects, much the same as dentistry in civil practice. Nine o'clock A. M., our operation hour, finds from twenty to thirty men waiting in the reception room, some of these by appointment, but many are new comers. Each of these bears a permit signed by the medical and executive officers of his ship or station, recommending that he be allowed to visit the Yard Dentist and certifying that he is, or is not, under treatment for contagious or venereal disease. A careful and comprehensive oral examination follows. On a record chart the actual condition of each tooth is accurately recorded. He is then given such immediate treatment as his case demands and an appointment made for a future time. Those having appointments receive attention at the proper hour, and as new men are constantly arriving, it is not unusual for this office to treat from 50 to 60 men during the morning session of three hours. The characteristics most necessary for the Naval Dental Surgeon are decisiveness of thought and action, rapidity and thoroughness in operation. He

must make a quick and an accurate diagnosis, determine at once his line of treatment and carry it through to a speedy termination. *Remember*—our patients are all men, not only the best physical products of our country, but men thoroughly trained and disciplined. To dental treatment they are most submissive and a murmur or cringe from pain, is very rare. I may say, however, those rare occasions do occur and are a source of great amusement for those who are waiting. Jack's is a rough life, accidents must occur and as a result, fractures and dislocations are to be expected. Idiosyncracies will be met and must be combatted. Preparedness must be the watchword of the dentist in the Navy. Antidotes must be at hand and resuscitation methods at his finger tips. This is no family practice, but instead, a great unending stream of humanity, steadily flowing onward and never returning.

The dental surgeon must take no chances, his work must hew close to the line of accuracy, for these few days in port may constitute Jack's last and only opportunity for dental service for many months to come. The afternoon session is but a repetition of the morning.

And now in conclusion, may I say we, of the Dental Corps of the Navy are a small but extremely important part of a great organization, engaged in the greatest struggle of history, and in these times, when every patriotic son of the United States is striving to do his humble part, you as members of the Massachusetts Dental Society can do no more loyal service for your country than to fight and work shoulder to shoulder, for the advancement of our chosen profession.

Dentistry today, gentlemen, is in the limelight. Far have we exceeded the bounds set by the most earnest and profound dental students of a decade ago, and the end is not yet.

Our country's call has not found the dental profession unprepared.

THE RESPONSIBILITY OF EDITORS OF PROFESSIONAL DENTAL JOURNALS

By BISSELL B. PALMER, JR., DD.S.

AT the present time particularly, when the dental profession is in a heated controversy over the question of professional *vs.* supply-house journalism, editors of dental journals of the former class should exercise the greatest care in selecting subject matter for their publications.

Many opponents of professional journalism are, strangely enough, bright in most other matters, and are apt to be exceedingly quick to hold up for derision any imperfections perceived in professional journals. When they come across some scientifically anemic article, without sufficient merit to justify its publication, even in a trade journal, these anti-professional journalists immediately call attention to it as an example of the calibre of literature generally found in professional journals. Such criticism is extremely harmful to professional journalism, and all true champions of the cause should see to it that ammunition is not supplied to our adversaries by careless editing of our too few professional journals.

It is generally known and understood that editors are at times hard-pressed for material and are inclined to use the best available, even if that "best" is not much good or very new. However, the editor of a professional dental journal has not the latitude in such matters, which other editors may have, and he should never allow an unscientific, worthless article to get beyond his waste basket. The publication of such an article is a reflection, not only upon his editorial ability, but also upon his scientific knowledge and operative experience.

A dental journal owned and controlled by the profession has for its purpose, not the publication of obituaries, the chronicling of forthcoming dental meetings or the gleanings from trade journals, but, instead, the dissemination of the latest and most valuable in dental research, investigation, theory and observation. If our

profession, for any reason, ever reaches the point where it cannot produce literature of this sort, then its journals had better cease publication, for no dental literature is far better than poor dental literature.

The editor of a supply-house journal is confronted with an entirely different proposition. The supply-house dental journals are not published for the same purposes as the professional journals. They differ fundamentally. The professional journal has for its object, as previously stated, *the dissemination of scientific knowledge*. The supply-house journal is primarily *an advertising medium* for its supply-house owner and it carries dental literature only as a necessary adjunct.

The average editor of a supply-house journal is employed by a dental supply company to publish an advertising medium of large circulation through which it can, at low cost, reach large numbers of prospective customers. It is presumably left to his own judgment as to the best method of inducing those prospective customers to subscribe for the periodical and thus help pay the advertising account of the company. It appears obvious to such editors, that the greatest inducement to offer for subscriptions is to publish, along with the advertisements, enough dental literature from writers of professional prominence to make the journal worth opening and reading. It is quite possible that it is merely a coincidence, but all supply companies which publish journals select as their editors, well-known and influential members of the profession; for, of course, no other type of editor could command worthy literary contributions.

The great difference, however, between the editor of a supply-house journal and the editor of a professional journal is that the former must, by contract, issue an advertising medium every time the month rolls around, regardless of the quality of the dental literature available, whereas the editor of the latter type of journal has no justification in bringing out his magazine unless there is dental literature available of sufficient value to deserve publication.

The serious publication of fantastic and impossible but highly sensational operative procedures, without the slightest foundation in scientific principles, is not only detrimental to the whole cause

of professional journalism, but is destructive of the value of the professional journal in which it appears, for it destroys the confidence of the reader in that periodical and without faith, no dental journal can educate, and a journal which cannot educate has lost its most vital function.

During the past several months many such articles have appeared in the dental journals and while adverse comment could be heard, no criticism has been published to offset their harmful effects. The greatest harm which results from the publishing of these papers is due to the hungry manner in which so many members of our profession grasp at truth and fact everything which appears between the covers of a professional journal. Possibly their confidence is justified by the fact that *they should be able to accept, at least as substantial, all articles published in such journals.*

In these days when every dentist, who has a slight knowledge of conductive anesthesia, considers himself an oral surgeon, and is willing to try any operation he reads of, merely because he can perform it without pain and without haste, it is risky for a professional journal to print articles advising unscientific operations, for those articles simply tempt such dentists, and the responsibility for the inevitable results of such ill-advised operations must rest upon the editor who allows his pages to advocate them.

The most striking example I have recently seen of what should not be published in a professional journal is the article, "Persistent Chronic Apical Inflammation and Its Treatment," published in the Journal of the National Dental Association, October, 1917. The author, Dr. John S. Marshall, has had awarded to him the degrees M. D., Sc. D. and F. A. C. S. The absence of the D. D. S. degree possibly explains and accounts for many of the extravagant and absurd statements in his article.

In the first paragraph one is prepared for what is to come by the following statement: "Some twenty or more years ago it was my privilege to prepare a paper that was read before the New York Odontological Society, entitled "A Plea for the Extraction and Replantation of Teeth for the Cure of Persistent Alevolar Abscess." In this paper I advocated the following method of treatment, namely: "The extraction of teeth with chronic dento-

alevolar abscess, amputation of the diseased apex, filling the root canal with gutta-percha, sealing the apical foramen and the cavity in the crown with gold, and, after thorough sterilization, replanting the tooth." Then comes the explanation regarding the failure of the profession to accept this operative procedure twenty years ago and the forecast of high resistance on the part of the profession now that the operation is again suggested: "I am fully aware that in again presenting my individual views upon this subject I shall run counter to a very strong and ingrained prejudice against extracting and replanting teeth, for any cause, which has gotten a firm grip upon the minds of the dental and oral specialist."

In Dr. Marshall's mind there is evidently only one reason why the profession does not accept his cure-all operation without question. It is due to a "very strong and ingrained prejudice." Some good friend should whisper to him the hint that the "dental and oral specialist" (who, of course, is in no position to judge of the merits of any dental operation), might, ignorant though he may be, honestly believe that Dr. Marshall's technic is unscientific and impracticable. Furthermore, such an opinion might be based on some facts known twenty years ago, and on some modern dental thought as well.

It is interesting to learn that "The ordinary septic tooth is not now under discussion. We are dealing only with those teeth which for various reasons fail to respond to the ordinary routine treatment generally employed by most dental practitioners." In other words, it has been Dr. Marshall's observation that the *ordinary, the everyday, the usual* abscessed tooth does respond to the *ordinary routine treatment generally* employed by *most* dental practitioners. I wonder if the writer has any idea of the percentage of dentists owning a roentgenographic apparatus and using it, or the number of dentists performing aseptic root-canal operations. I am forced to believe that Dr. Marshall is guessing at the "ordinary treatment generally employed by most dental practitioners" just as he has evidently guessed at many other points brought out in his essay. There is no question about the "ordinary septic tooth" responding to "the ordinary routine treatment generally employed by most dental practitioners," but, oh, what a

response! Has Dr. Marshall, by any chance ever studied the tables of findings of those investigators who have examined thousands of "ordinary septic teeth," which have received the *ordinary* treatment of *most* of the dental practitioners? Has Dr. Marshall inadvertently stumbled upon the reports of Hartzell, Grieves, Billings, Irons, or any of the others who have studied the response of the ordinary septic tooth?

Next we learn that septic teeth are treated by medical and by surgical methods and that "the latter comprehends all those procedures, which are addressed to the surgical removal of the diseased tissue of the apical region, according to approved surgical principles." Then the author goes on to state that he will present "only the surgical side of the question," and all is well until we absorb Dr. Marshall's surgical side of the question, when we become delirious with curiosity regarding the names of those who "approved" his "surgical principles."

A little further on we gain a clearer insight into our essayist and his opinion of the dental profession generally. He states: "If a general anesthetic is decided upon, secure, if you can, the services of the family physician as the anesthetist. If a local anesthetic is decided upon, his presence is also desirable, as it is always wise to divide the responsibility in all surgical cases."

All oral surgeons know of the experience and skill, which even specialists must have to keep patients who are undergoing mouth operations, anesthetized. Just imagine the three-ring circus one would witness with the average "family physician" administering a general anesthetic for a prolonged mouth operation! A brilliant thought that—regarding the division of responsibility with the *family physician*, when we administer a local anesthetic; and to reciprocate, certainly the *family dentist* should be called in every time the *family physician* lances an abscess.

The technic which the doctor offers for the apicoectomy in situ operation may be passed over lightly, as it has all appeared many times before in our dental journals. However, there are one or two unusual steps in the technic upon which we might touch in passing. One is the longitudinal incision mentioned, the other is the actual amputation of the apex "with a pair of small

bone nippers." The former step is mentioned merely as interesting and a little unusual, and the latter step I touch upon only to suggest that a few minutes of meditation be indulged in by the operator before practising apex amputating with "bone nippers."

Dr. Marshall advocates closing the wound of an apicoectomy operation immediately for, "by the employment of surgical packing, reinfection from the oral secretions is very liable to occur." While I can understand, and freely admit, that there are advantages in closing such a wound immediately, I am not ready to admit that one of the advantages is a camouflage of the wound so that bacteria of the mouth will not become aware of its existence.

We now come to the feature of the article, and in reviewing it, let us not allow our "ingrained prejudices" to sway us. The claims made for this operation of apicoectomy *ab situ* by Dr. Marshall are indeed extravagant. Let us see what these claims are: It need only be "performed with reasonable care to asepsis," "A very large majority of teeth [so operated] can be saved," "With very few exceptions any tooth in the mouth may be treated with this surgical method," "There will be no post-operative pain or soreness," etc., etc.

As a matter of record it would be very interesting to learn how Dr. Marshall gained the impression that an operation "performed with *reasonable* care to asepsis" is performed "according to approved surgical principles." The other optimistic claims will not survive even a fleeting glance, much less an analysis along scientific lines. The claim that the operation is practically universal in applicability must appear at least as an ill-considered statement to any operator at all experienced in exodontia, and it is hard to believe that the statement "There will be no post-operative pain or soreness" was written in a serious vein.

How often when some very valuable and quite simple invention is heard of, it causes us deep anguish because we had not thought of it first. I cannot help wondering what the innermost feelings of our exodontists must be as they read Dr. Marshall's extracting technic. When they realize all the teeth that have crumbled in their forceps, and the difficulty which they experienced in extracting the broken pieces subsequently, and the spreading of the process, and the painful sockets patients often

have to contend with afterwards. How they must berate themselves for not having thought of the way to avoid all the foregoing difficulties, and they must certainly be most grateful to Dr. Marshall for his great though simple gift to the specialty and the profession.

Dr. Marshall's technic is as follows: "The best way to avoid (bruising the enamel or fracturing the crown) is to place a piece of softened modelling compound upon the inside of the jaws of the forceps and while still soft, apply the instrument to the tooth. This gives a perfect impression of the crown and will, with proper care, prevent all injury from extraction."

It is peculiar how an interesting thought hits one quite unexpectedly at times. It just occurred to me that if Dr. Marshall's modelling compound technic prevented "all injury from extraction" and his statement is true, that "there will be no post-operative pain or soreness," then *possibly the tooth does not even leave its socket*. Yet by reading further, we find that it does come out just as planned, and that it must receive immediately a vigorous sterilization. "As soon as the tooth is removed, place it in a solution of mercuric chlorid, 1 to 500 of water, which has been previously heated to a temperature of 103 degrees F. and so maintained. The tooth should be allowed to remain in this solution for a period of five to ten minutes, or even longer." After some other steps in the operation are completed, the tooth is removed from the solution but only for a second or so, for it is immediately wrapped in a piece of gauze saturated with the same solution.

Then the apex amputation is performed, "being sure to cut no farther than the line of denudation of the pericementum. This is important as it is through this membrane that the vital connection is re-established." Next the apex is prepared for a beautiful gold filling. Then "the pulp canal should next be thoroughly irrigated with the mercuric solution by forcing it through with a syringe and then again placed in the solution for at least 10 to 15 minutes to complete the sterilization," however *do not injure the pericementum*, "as it is through this membrane that the vital connection is re-established."

Then come several other steps in the technic followed by, "Before replanting the tooth it should again be placed in the mercuric solution for another 5 to 10 minutes to insure against infection from the handling," *but be careful not to injure the pericementum*, "as it is through this membrane that the vital connection is re-established."

Well, everybody can learn, and I would recommend to all surgeons specializing in bone grafting, that they read and learn the latest word in handling tissues about to be replanted or transplanted. Hereafter when they have skilfully resected a section of rib or tibia for grafting purposes, they will be expected to soak it in mercuric chlorid 1-500 solution, heated to a temperature of 103 degrees F., for a period of about an hour and a half before inserting the section. It might be well to repeat to the bone-grafting surgeons, the note of warning which Dr. Marshall has sounded regarding the care which must be taken in handling the part to be replanted. *Do not under any circumstances injure the periostium* "as it is through this membrane that the vital connection is re-established."

I do not doubt for a moment that apicoectomy in Dr. Marshall's *hand* has "proved eminently successful," but to put it mildly, I am not convinced as yet that the operation is a successful one for the mouth of a human being.

In all charity and broadmindedness, I feel that the only alibi which can be offered by the editor who allowed Dr. Marshall's paper to get into print, is that he intended starting a department of light humor and inadvertently omitted the heading.

THE CONTRIBUTION OF MASSACHUSETTS DENTISTS TO THEIR STATE¹

By DR. C. R. LINDSTROM, Boston, Mass.

WHEN a year ago last June the National Guard of Massachusetts was mobilized preparatory to leaving for the Mexican border, reports came in regarding the deplorable condition of the teeth of the men. Some members of the Board of Dental Examiners went to the Framingham Camp and examined approximately five thousand men. It is needless to say that this examination was of necessity hurried and superficial, but it served to show that about 75 per cent of those enlisted needed dental services, and that at least 40 per cent were in serious condition. The conclusion was reached that the fighting efficiency of the men was reduced by at least 20 per cent from this cause, and this report was made to the Governor.

This year, when war with Germany was declared, a large number of the dentists wrote to the Surgeon General of the State, offering their services free of charge, the work to be done at their individual offices.

Dr. Payne, Secretary of the Board, was called in conference with the Adjutant and Surgeon Generals to see if something could not be done to help existing conditions, with the result that the Board was asked to take charge of the work. The Massachusetts Dental Society, as well as the Metropolitan District Society, then appointed committees to see how the need could be met.

The State officials felt that the work should be undertaken by the Board of Dental Examiners. Consequently a letter (No. 1) was sent to a dentist in each city and town where an armory was located, asking him to accept an appointment as chairman of a committee of dentists from his city or town, who would co-operate with him in this relief work.

Examination blanks and a circular of information (No. 3) followed after his acceptance. A record of all letters sent and

¹ Read before the Metropolitan District of the Massachusetts Dental Society, October 8th, 1917, in Boston, Mass.

those received, as well as of all operations performed, was kept. Examinations were made by committees in the armories and lists of names of such dentists as offered their services were posted therein.

Dr. Hale, the Chairman of the Board, had charge of the work in the western part of the state; Dr. Barrett of that in the Worcester district; Dr. Carriere in the Fitchburg section, and Drs. Payne and Lindstrom of that in the Metropolitan district (the northern and eastern parts of State).

The Dental Schools of Harvard University and of Tufts College, and the Dental Clinics of the Boston Dispensary, coöperated with us most generously and efficiently, while the dentists throughout the state responded splendidly to this appeal for service.

When we tell you that about forty thousand operations, which included examinations, plastic fillings, extractions, root canal fillings, the treatment of pyorrhea, and even in some instances gold fillings and the making of numbers of plates and bridges, were performed by the men operating, and that materials of all kinds were paid for by the operators themselves, you can have some idea of the magnitude of the contribution made by the dental profession to the State.

I know that every dentist who responded to the call of this great need feels happy that he has been able to contribute "his bit" in this great work of preparedness.

Four detailed reports of the work done have been made to the State Surgeon General and to the Public Safety Committee and another is in process.

A commercial valuation of the services rendered by the profession to the State would be approximately about \$100,000. I am sure that we can be justly proud of such a generous contribution.

The Public Safety Committee appropriated \$9,000 for dental equipment for the armories. Before that could be received and delivered the work was well under way in private offices.

Sixty-five hundred dollars was expended for 60 units each of

them containing the following:

- 1 S. S. White portable chair
- 1 Cuspidor
- 1 Cuspidor Bracket
- 1 Dental Foot Engine
- 1 No. 7 Hand Piece
- 1 Hood Angular Hand Piece No. 3
- 2 Oz. Absolute Alloy
- 10 Tubes Novacain
- 1 Foot Engine Belt
- 6 Pairs Universal Forceps
- 1 Alcohol Lamp
- 1 Lancet
- 1 Mortar and Pestle
- 3 Boxes Petroid Cement
- 2 Boxes Assorted Temporary Stopping
- 1 Box Calxine, white
- 2 Boxes Cotton Rolls
- 1 Box Cotton Napkins
- 2 Boxes Johnson & Johnson Cotton Points
- 1 Box Pink Canal Points
- 2 Imperial Syringes
- 2 Doz. Hypodermic Needles
- 1 India Stone
- 1 Probe
- 1 Coolidge Elevator
- $\frac{1}{4}$ Lb. Mercury

Drugs.

- 1 Oz. Trichloracetic Acid
- 2 Oz. Eugenol
- 2 Oz. Phenol-Carbolic Acid Cryst
- 4 Oz. Zinc Oxide
- 1 Pt. Alcohol
- 1 Qt. Denatured Alcohol
- 1 Lb. Bicarb. Soda
- 1 Pkg. Pearline
- 2 Oz. Chloroform
- 1 Oz. Glycerite Iodide of Zinc.

The units are at present in the various armories of the State, and will be used as a nucleus for a more complete outfit and a permanent dental office in each armory.

It is reported that there are thirty-seven Dental Surgeons at Camp Devens with no instruments. In all probability the Public Safety Committee will lend or sell sufficient equipment to the

Government so that these Dental Surgeons may begin work.

I take pleasure in reading a letter from the Governor showing the appreciation of the State for the services rendered.

Commonwealth of Massachusetts,
Executive Department,
State House, Boston,
September 22, 1917.

DR. GEORGE H. PAYNE, *Secretary*,
Board of Dental Examiners,
State House, Boston, Mass.

Dear Doctor Payne: I want to express to you and through you to the dental profession of Massachusetts my deep appreciation of the noble service that has been rendered in giving attention to the teeth of our soldiers. I have been in close touch with the work that has been done under your direction both in connection with the Public Safety Committee and otherwise and know that the Commonwealth is deeply appreciative of this great Public Service.

I can assure you of my continued support in this splendid work.

Very truly yours,

(Signed) S. W. McCall.

REPORTS OF SOCIETY MEETINGS

FIRST DISTRICT DENTAL SOCIETY OF THE STATE OF NEW YORK

Nov. 5, 1917

A regular meeting of the First District Dental Society of the State of New York was held on Monday evening, November 5, 1917, at the Academy of Medicine, No. 17 West Forty-third street, New York City. The President, Dr. Charles F. Ash, occupied the chair and called the meeting to order.

The paper of the evening was read by Dr. L. M. Waugh, of New York City, and was entitled "Deviations from the Normal in the Teeth and Their Supporting Structures."¹

Discussion of Dr. Waugh's Paper

Dr. I. Norman Broomell, of Philadelphia :

While Dr. Waugh was reading the paper, I was reminded of an incident which occurred several years ago, when I made my initial bow to a dental audience. I was not reminded of it because of the similarity of the conditions, but because rather, of the dissimilarity. The occasion was a meeting of the old Odontological Society, and all of the crowned heads—the lofty ones in the profession, were present—not because I was to read the paper, but because they thought they should be there to lend dignity to the occasion; and it seemed to be the custom in those days for these older men always to be on hand.

At the conclusion of my paper, which had caused me many restless nights, one of the older members—a little fellow with chin whiskers and much experience—got up and said that he would be delighted to discuss the paper, if there were anything

¹ See Dr. Waugh's paper in full at p. 437.

in it to discuss. He said all the expressions in the paper were nothing other than those that had been "learned parrot-like," so naturally I received a blow from which I have scarcely ever recovered.

I do not want Dr. Waugh to think that his paper has any comparison with that paper. The fact is, what Dr. Waugh has said is so absolutely true, and so full of recorded facts, that it seems almost an impossibility for anyone to take exception to what he said, or discuss the subject. One might almost as well attempt to discuss the anatomy of some part of the body, or the question of the circulation of the blood. There are established facts with which we are all acquainted, and almost everything Dr. Waugh has included in this excellent paper is of that type; so I say, it is not a discussable paper.

I was pleased to note that the essayist wisely began in the right way—as I knew he would—by first considering the normal, taking this as the basis for a proper consideration of the abnormal or pathological.

It is an unfortunate fact that too frequently, when we are considering pathology—not only dental men but some medical men as well, forget the histology of the normal parts. I have often wondered why, and I have begun to believe that the foundation for this error is established in the dental college. I do not mean to say that the modern dental college is not equipped to teach these important branches, but I mean the average student does not seem to appreciate the importance of these—what might be called collateral branches—although they are not collateral. Occasionally, we find a student who is interested in histology or pathology; but seldom do we find one who takes an active interest in work.

Under the sub-heading of "The deciduous dentition," Dr. Waugh describes very fully the process of tooth growth and eruption, and finally adds that "the growth of each successive tooth is exerting pressure upon those previously erupted, causing them to move more to the occlusal." I wish he had gone further into this, to the extent of throwing some light upon the real force behind all this process of tooth eruption. We might per-

haps receive the statement, which is an accepted theory that "The growth of each succeeding tooth exerts pressure upon those previously erupted"; but what force is responsible for the eruption of those teeth without predecessors—the deciduous teeth?

While the growth of the succeeding tooth may have some influence upon those already erupted in the way of pushing them occlusally, is it not a well-established fact that they advanced almost as promptly, when for some reason the succeeding tooth is absent?

Of the many theories advanced regarding the forces at work responsible for the eruption of the teeth, none seems more plausible than the blood pressure theory, especially when we have as evidence the elongation of a tooth in peridental inflammations, and the prompt release of an imprisoned tooth after lancing the gum.

We note the statement that "Bone development in the jaws is largely dependent upon proper mastication, etc." Nowhere do we find the aphorism that "Function governs organization" more fully carried out than in the process of tooth and neighboring bone development. In fact, this of itself might be sufficient explanation to account for the eruption of the teeth. It becomes a normal, physiologic process necessary to fulfill the function of the parts. The teeth are not the only organs of the body to move from one part to another during development, in order eventually to perform their function.

The question of dental caries as treated by the essayist, embodies the sum and substance of our present knowledge of this important subject, and will, therefore, receive but little comment from me. While we all accept the theory that a clean tooth will not decay, we cannot get away from the fact that many teeth that are dirty do not decay.

I am reminded of an incident which occurred in my own office rather recently, in connection with a woman who thought she had a dreadful disease. She thought she had a cancer of the gums, as she stated. A hasty glance showed me there was no cancer present. I refused to allow her to take a seat in my chair,

and told her, she had something worse than a cancer. She wanted to know what it was. I said: "Your mouth is so filthy that I will not permit you to take a seat in my chair; but if you will go home and clean your mouth, perhaps I will do something for you." She said: "But I did clean my teeth this morning." I said: "There is no evidence of it." She asked: "What shall I use?" I said: "You might start in with 'Dutch Cleanser.'" To my surprise, she returned in two or three weeks and she evidently had used "Dutch Cleanser" or something of equally abrasive quality. Upon examination I discovered a most beautiful set of teeth, without any sign of caries.

So while we say, clean teeth will not decay, we sometimes find that dirty teeth do not decay.

Under the sub-heading of "Diseases of the dental pulp" the essayist has, in the beginning of the general subject, wisely insisted upon a full understanding of the normal, before considering the pathology of this tissue. He has told you of the peculiar embryo-like character of the dental pulp, and to this I would add that in no other part of the mature body do we have a structure of like character. While compared in its histological make-up to the marrow of long bones, it differs in this respect: for example, the so-called pulp cells do not anastomose as do the osteoblasts, and no attempt at the establishment of an Haversian system is present. Even if we compare the pulp in its entirety to a single bone cell, as is sometimes done, the comparison fails when we study the dentinal fibers, which are necessary to complete the comparison.

The constructive and destructive diseases of this tissue are necessarily different from similar conditions in other parts of the body. Tubular calcification and secondary dentin might be classed as a physiologic change as well as a pathologic one, this being made possible on account of the peculiar embryo-like condition of the pulp itself. It must also be borne in mind that we can have well-defined tubular or fibrillar calcification without much or any pulp involvement, as Dr. Waugh has shown.

Regarding pulp nodules, there has always been a doubt in

my mind as to whether they belong to the constructive or destructive diseases of the pulp. Of one thing we are sure—they are constructed; but the question is—from what source? Being constructed in some way within the pulp cavity, they, in a sense, belong to that category; but I fully believe that they also are destructive, and that they represent the destruction of calcification of just so much pulp substance, chiefly on account of the activity of odontoblasts, which after a time detach themselves from the wall of the pulp cavity, the mass then being carried into the body of the pulp substance.

Exception might be taken to the statement in the paper which says: "It is appreciated that normal dentin supplies something? to the enamel which sustains its integrity."

I have placed a question mark after the word "something," because I fully believe it should read "nothing," in place of "something." When we consider the true nature of fully desiccated enamel, it seems difficult to recognize anything but a finished product—a coat of mail, as some text books call it—a tissue that requires no nourishment and through which sensations are carried by transmission only.

One of the most encouraging features in the paper is that it refers to the wisdom of the removal of healthy, rather diseased, pulps. In place of so many attempts at "conservative pulp treatment," let us inaugurate a system of "anticipation treatment," whereby we make it possible, with aseptic surroundings, to remove any pulp suspected of being subject to infection, hermetically and antiseptically fill up the space previously occupied by it, and in this manner obviate to a great extent possibility of the greatest stumbling-block in modern dental practice.

There is much we might comment on. A goodly portion of the paper, as the essayist read it, did not reach me. Fortunately it did not, for I barely had time to review the portion that did arrive. The part of the subject that interested me most, perhaps, was that which had to do with the development of the parts under consideration, especially the blood and nerve supply to the same; and I am probably better acquainted with that part than any other feature.

I brought with me a few old slides that might assist in describing some of the features so nicely brought out by the essayist, particularly those which had reference to the subserving of the bone to the wall of the tooth.

Dr. Frank A. Gough:

I was asked to discuss this paper from the orthodontic standpoint, and I shall therefore confine my remarks to the first part of the paper.

Since the days when orthodontia became a specialty and Dr. Angle made us realize the great importance of normal occlusion, dental practice in all its branches has made wonderful progress, and I believe that no small part of that progress has been due to the influence of orthodontia.

The essayist has given us such an exhaustive survey of his subject that there is very little to add to his enumeration of deviation from the normal, although mention might be made of lip and tongue habits, supernumerary teeth, absence of tooth germs and tipping mesially or distally of individual teeth. It should not be forgotten that the same forces which develop and maintain the normal are the very forces which, when diverted, are potent in converting slight deviations from the normal into pathological conditions.

Some slides were then shown.

Doctor Waugh (closing discussion).

Permit me first to thank you for your kindness in listening attentively to so long a paper. There will be very little for me to say in closing the discussion. I came prepared to defend the practice advocated, but it becomes unnecessary, since the gentlemen who discussed the paper seem to be in accord with the statements made.

Therefore it remains only for me to express my appreciation and gratitude to Doctors Broomell and Gough for amplifying my effort and to the members for receiving the paper so kindly.

Adjournment.

C. G. FLETCHER, D.M.D.,
Editor, First District Dental Society.

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EDITORIAL DEPARTMENT

"THE SEPTIC DENTIST"

Self-examination, if not agreeable, is generally a profitable exercise on the part of anyone who would progress. It is unwise to dodge destructive criticism,—for those who would chastise see our faults with a clearness which is denied us, and so with little effort we learn a wholesome lesson. THE JOURNAL has always endeavored to prevent, among its readers, that congealment of good self-opinion which is the besetting infirmity of professional men, and which is commonly known as complacency. The mind

which relies for security on its own traditions, is ever in danger of a "jolt."

We print elsewhere¹ a letter from a physician which holds up to every dental practitioner a picture which must command instant attention, for it touches to the life any pretensions he may have to be regarded as a scientific man. These serious charges made by Dr. Bowers against the dental profession are either true or false; it will be well to consider them carefully.

Dr. Bowers deplors the possibility of placing the Army Dental Corps on an official equality with the Medical Corps, or the acceptance of dentists as associate members in medical societies. Should these things come to pass, the result would be a "catastrophe." "There is no more reason for a dentist than there is for a chiropractor." The sentence quoted leaves us to infer two things: that there is no need for dentistry, which is a self-evident absurdity; or, that dental practice in the hands of the dentist, instead of a medical specialist—an odontologist, shall we call him?—is of no avail. If the latter is Dr. Bowers' meaning, we should like to ask if she really believes that the science of dental practice itself will be changed essentially by the change of the operator's title? All will admit, of course, the desirability of the broadest possible medical knowledge consistent with the practice of any specialty; but will any amount of general knowledge change the *best known* procedures which have been determined by the specialist in any field? By whatever name we may call him, the specialist must be governed by the nature of his work, and the most intelligent and successful practitioner is he who sees clearly, and is governed by, the character and the limitations of his chosen field. It is no new thing for the general medical practitioner to look with contempt upon the "mechanical" aspect of dentistry; but a very large part of dental practice

¹ See letter from Rose Alexander Bowers, M.D., to editors, *N. Y. Medical Journal*, Nov. 17, 1917, at p. 534.

is applied mechanics, just as a large percentage of the problems of the ophthalmologist lies in the science of optics, or of the aurist in acoustics. The dental specialist, whatever his degree, must devote most of his life to mechanical procedures: if that is beneath him, it is equally true that dentistry is beyond him.

Dr. Bowers' reference to the curriculum of the average dental school is an indication of her meager knowledge of the subject. While it is true that the dental school of to-day has not evolved to its full scientific standard, nevertheless the Association of University Schools has adopted the four-year dental course—and at least one such school—that of Columbia University—has placed its curriculum on an exact equality in academic credit with that of its medical school. At the present writing there are thirteen dental schools which are organic parts of standard universities in the United States. It is a fact, then, that dental education is receiving serious attention in the leading centers of learning in this country. Dr. Bowers' strictures on this subject, and her statement that "the practice of dentistry is not a profession but a trade"—reflect light, principally, upon the extent of her ignorance concerning the topic she has chosen to discuss.

"Being a victim of the dentist's trade, and not an occasional visitor, I have yet to see an instrument sterilizer, a scrub-brush for aseptic purposes, or disinfecting solution for the hands, even after treatment of a patient with pyorrhea." Furthermore, Dr. Bowers has not yet seen "a small X-ray cabinet" in a dental office. We are forced to believe that Dr. Bowers has been unfortunate in her selection of dental offices. We believe that in the vast majority of offices of any reputability, used instruments are boiled. Also that the X-ray machine has become a part of our standard equipment. But here we must confess a just ground for criticism. While an ever increasing number of dentists are really

careful concerning hand cleanliness, we *know* there are some busy men (including those of Dr. Bowers' acquaintance) who will pick up a ringing telephone before stepping to the wash basin. This, and other sins of omission and commission, are perhaps accounted for by the non-sterile nature of much dental work; but they are not excused thereby; they are indefensible.

Dr. Bowers is amused by the use of the word "emphyema" by one who should know better. We agree with her; there are few more important fundamentals than correct spelling and the use of correct English. We cheerfully agree that the dentist should know more about "minute microscopy"—especially as to where-in it differs from ordinary microscopy.

The dentist is taken to task—and properly so—for a too limited knowledge of general medicine, particularly of bacteriology. While admitting a defect which, nevertheless, we believe is being rapidly corrected in our schools, we must call attention to the benighted ignorance concerning dental science on the part of the physician, which is shown quite classically in Dr. Bowers' pronouncement. It is made perfectly clear that the "open-sesame" for the dental specialist is the M. D. degree. If he knows general medicine—as set forth in the standard medical curriculum—then he is equipped to practise dentistry, for dental science is a part of medicine. Nothing simpler, and about all the attention the subject deserves from the medical viewpoint. The well-equipped dental practitioner, fully alive to the importance of a broad medical training, knows that the M. D. does not make a dentist. He cannot know too much of general medicine, but he *must be expert* in many mechanic, engineering and artistic procedures with which the physician has nothing to do. These subjects will always occupy much time in a properly planned dental course.

Reverting to the objection of placing the Dental Corps on

official equality with the Medical Corps, we should be glad to know the grounds for that position. Is it a lack of importance or "dignity" in the dentist's work? Well, it is known that diseased teeth may hazard life, and the armies of the world to-day are taking scrupulous care of the teeth of their fighting men. We do not think our field lacks importance or dignity. On the contrary, we insist that adequate dental service is an essential part of a modern army. Is there a fear that the Dental Corps may acquire undue powers and clash with the Medical? Why is it that the colonel of the line and the medical colonel coöperate without friction or jealousy? Each knows the other will mind his business within strictly defined limits, and the line officer thinks none the less of the medical officer of the same rank because he is unable to lead a regiment into action. The distinction between the official medical and dental fields is far less, of course; but the well trained dentist, as an officer, is better fitted than any physician can be to administer the dental department, and if he is limited to that important work, the medical officer should welcome him as a brother and an equal, without fear of risking his own consequence. The equal rank is necessary, if a dental officer is to administer his department effectively.

We deplore the tone of reckless denunciation which runs through Dr. Bowers' letter, especially at a time when a cordial understanding between dental and medical men is so important for all concerned. Her admonition that the medical profession should "hold high its noble domain and repel any intruder" rings with the spirit of the priest or the medicine man, aloof and above mankind; the very antithesis of the scientific spirit of today, which grasps at anything which is good, encourages anything which may be made better, which despises self-glorification, and is dedicated simply to human service. We agree that quacks and charlatans should be "repelled" as "intruders" from asso-

ciations of professional men; the dentist of today is a self-respecting, capable specialist in a department of medicine of acknowledged importance. If he lacks anything in scientific equipment, let it be remembered that his first school was founded only seventy-eight years ago, and that the advancement of dental science in that brief period has been phenomenal. The dentist is measuring up to his true place in the world's work, as the surgeon did not long before him; he will take his place, welcomed and honored by the elder profession, when those who would have disowned him will be glad to have their words forgotten.

CURRENT DENTAL LITERATURE

Compiled by ARTHUR H. MERRITT, D.D.S.

Titles marked with an asterisk (*) are abstracted briefly.

The Dental Cosmos, Sept. 1917.

- 55 **A Method of Sterilizing, and at the Same Time Impregnating with a Metal, Affected Dentinal Tissue.** P. R. Howe.

Two solutions are recommended; first a saturated solution of silver nitrate to which is added little by little strong ammonia, until the solution becomes clear. Second, a 25% solution of formalin in water. These should be kept in dark colored, glass stoppered bottles and as much as possible away from the light. In the treatment of non-vital teeth, protect the tissues preferably with rubber dam, and apply to pulp canals some of solution No. 1 to be followed by a small amount of solution No. 2. A broach wrapped with cotton will serve the purpose; after a few moments absorb excess and repeat the process in order that more silver may be reduced and deposited. All defective tooth structure is rendered jet black by the treatment though it does not seem to penetrate sound tissue. For this reason it is desirable to limit it to posterior teeth. Suggestions for its use in anterior teeth are made. The following claims are made for it:

- 1st. It is possible to completely sterilize the putrescent pulp without removing it and also the dentinal structure of the root.
- 2nd. It is effective in the sterilization of disintegrated dentin overlying pulps; in the treatment of chronic abscesses; in taking care of apical foramina when properly used; in those cases in which slight apical sensitiveness exists following the removal of the pulp under local anesthesia; in painlessly disposing of remnants of pulp tissue after death or removal of a portion of it, and as an application to root ends after apicoectomy. It permeates all affected dentin and at same time fills it with metallic silver.

The Dental Cosmos, October 1917.

- 56 **A Study of the Microorganisms of Dental Caries.** P. R. Howe.

The author reports a study of the organisms of dental caries as seen in children between the ages of 10 and 14, and limited to first and second molars in which there was no pulp involvement. These investigations were carried on under the following conditions.

- 1st. In teeth in which fillings were inserted over carious dentin, which fillings were allowed to remain from 6 weeks to 3 months. They were then removed and the underlying carious dentin cultured.

- 2nd. Teeth in which fillings possessing slight antiseptic properties were placed over carious dentin but left for shorter periods.
- 3rd. Teeth in which the carious material was studied from open carious teeth. As a result of careful comparative study the Author concludes that the Morro-Tissier group of organisms is the constant and predominant flora of dental caries; that these organisms present the same morphological features as do those isolated from the intestines in nurslings; that their high acid forming properties limit the character of the flora found in carious teeth, and that they possess in greater degree than do any other organisms, the attributes considered necessary for at least initiating the process of dental caries.

Journal of the American Medical Association, July 21, 1917.

57 Investigations as to Frequency of Metastatic Eye Infections From Primary Dental Foci.

J. M. Levy, W. F. C. Steinbugler, and M. C. Pease, Jr.

A report is made of 57 patients suffering from various eye conditions which were sent to the Herman Knapp Memorial Eye Hospital for dental treatment, showing that a little over 50% of the cases were either cured or benefited by such treatment. The conclusion is not to be drawn that 50% of infectious eye diseases will be cured or helped by dental treatment, but when mouth infections are coincident with infectious eye diseases there is a strong probability that the dental foci may be a causative factor. A significant feature of the 10 cases reported is that in all but one, the dental infection was found to be on the same side with the affected eye. This has led the authors to conclude that metastases, from dental foci at least, do not occur through the blood stream but through lymphatic channels. They admit, however, that they have not been able to verify this conclusion by animal experimentation.

Journal of the American Medical Association, Aug. 11, 1917.

58 The Experimental Production of Cancer. Editorial.

Attention is called to the fact that experiments have proved the fact that protracted irritation, without an inherited tendency, or any specific agent, is able to induce cancer with typical cancer metastasis. Further, that on cessation of the irritant, the carcinoma may retrogress and be crowded out by proliferation of connective tissue. In these cases the cancer cells do not return to normal, but are prevented from further growth by the pressure of the proliferating connective tissue, which finally replaces them completely.

Journal of the American Medical Association, Aug. 25, 1917.

59* Roentgenographic and Microscopic Studies of Tissues Involved in Chronic Mouth Infections. A. D. Black.

60* Vaccine Treatment Again. Editorial.

59 Roentgenographic and Microscopic Studies of Tissues Involved in Chronic Mouth Infections.

As a result of his studies, including a roentgenographic examination of about 400 persons for the purpose of determining the frequency and extent of infections of the maxillary bones, the Author, after emphasizing the exceeding importance of preventive treatment, reaches the conclusion that suppurative detachments of the pericementum are in practically all cases permanent detachments, whether they take place at the side or at the apex of the root. The bone destroyed about the apices of roots is not so important as the extent of destruction of the pericementum. "There is no hope of reattachment of the surrounding tissue to the root and if such teeth are permitted to remain in the mouth—excepting those which are operated on by resection—it should be with the definite understanding that they necessarily continue as a menace to the health of the individual, and that the use of such teeth in mastication over-balances this menace to the health. In such cases we are using our best judgment as to the patient's general physical condition and his resistance. We must do this with the thought ever in mind that nephritis, endocarditis, cholecystitis and other secondary effects are so insidious in their outset that the condition is likely to be serious and the patient even beyond the possibility of recovery before it is discovered by the physician. The more I study these conditions the more I am convinced that more teeth must be extracted."

60 Vaccine Treatment Again.**Editorial.**

Regarding the uncertain value of vaccine therapy, the Author continues: "On account of these facts it obviously is utterly impossible to judge of the effects of any given treatment of such diseases without the most careful comparative observations in treated and untreated cases of such nature and under such conditions that the results obtained in the two groups are comparable. As pointed out by Leake in his article on bacterial vaccine therapy, whenever this kind of study has been made so far, the results appear to be about the same in the two groups, the test group and the control group. This is true not only of whooping cough and typhoid fever but also of that intractable infection, gonorrheal vulvovaginitis in young girls, and, we believe, in pyorrhea alveolaris too. As for the strikingly favorable results in individual instances reported by vaccine enthusiasts, and repeated over and over again in advertisements, they are all matched, every one of them, by equally brilliant results in cases not treated by vaccines and of frequent occurrence everywhere. In other words, the present situation as to vaccine treatment illustrates again that uncontrolled clinical reports have no value as evidence as to the curative value of a treatment in spontaneously

variable and self-curable diseases, and the case in general for bacterial vaccine therapy is not proved."

Journal of the American Medical Association, Sept. 1, 1917.

61 Organic Changes in the Central Nervous System Probably Due to Focal Infections. G. W. Hall.

A report of 3 cases of disturbances of the central nervous system is made, due in the Author's opinion to infection proceeding from tonsillar and mouth infection. Two of the 3 patients showed slight arthritic changes in the vertebrae, most pronounced at those points which correspond to the most definite changes in the central nervous system. Pyorrhea seems to have been the prevailing mouth infection.

Journal of the American Medical Association, Sept. 8, 1917.

62 The Non-specific Character of Vaccine Therapy. J. L. Miller.

The Author makes report of 93 cases of acute arthritis treated by intravenous foreign proteins usually in the form of typhoid vaccines. Of this series, 80 patients were either relieved of their pain or were greatly benefitted by from 1 to 4 injections given daily. Six showed only moderate improvement and 7 were not benefitted. In the majority of cases there was no marked recurrence. Mild recurrences, however, are not uncommon, taking place within one to ten days or more. These appear to be due to reinfection of the joints. The effect of the treatment seems to be limited to the joints themselves; the primary foci, and endocarditis, when present as a complicating factor, appears to be unmodified by the treatment. Following the injection, the patient within a few minutes to an hour has a chill, usually quite severe with marked rise in temperature, 104 to 105F. This is usually followed by a slight leucocytosis, which is in turn followed by a leucopenia of brief duration. A rapidly developing leucocytosis finally results, gradually returning to normal. The chief difficulty in this form of therapy is the violence of the reaction. It is the consensus of opinion, however, that marked temperature reactions are essential to good results. Some observers consider the fever as the essential factor in the curative action and have referred to the treatment as "fibrile therapy." The danger from grave or fatal reactions is always present. It must therefore be regarded as in an experimental stage and should not generally be applied without careful consideration of the dangers associated with its use.

Journal of the American Medical Association, Sept. 22, 1917.

63 The Retention of Devitalized Teeth Without Danger of Focal Infection. M. L. Rhein.

The most common cause of failure in the treatment of devitalized teeth even among skilful operators is, in the opinion of the Author, an

imperfect encapsulation of the root end. Bone regeneration about root ends may proceed for a time, and then, as a result of imperfect encapsulation a new infection may occur. If found impossible to effect permanent bone regeneration an apicoectomy is indicated.

New York Medical Journal. Aug. 11, 1917.

64 Diagnostic Teeth.

P. W. Roberts.

Attention is called to the fact that syphilographers have within the past few years added much to the observations of Hutchinson regarding the influence of hereditary syphilis upon dentition, it being now generally recognized that there are at least 3 dental malformations equal in importance to the classical Hutchinson teeth, viz., cuspal hypoplasia of the sixth year molars, multiple and systematic dystrophies of the permanent teeth, and multiple dystrophies of the deciduous teeth. Furthermore, that there are also entitled to consideration, many other distortions both in form and arrangement of the teeth, which occur more frequently in hereditary syphilis than in any other disease. Of these, the most common are absence of teeth, symmetrical erosions of various kinds, striking irregularity of form and distribution, anomalies of spacing, microdontism, cleft teeth, white sulci and tendency to early caries. Great stress is placed by the Author upon abnormal spacing between the upper central incisors. While the condition may be produced by other causes than syphilis, the fact that the anomaly occurs in recognized syphilitics gives it a distinct diagnostic value. It may be the only dental irregularity in a subject of inherited syphilis. Several cases are cited showing this relationship. Emphasis is made of the fact that Hutchinson's tooth is only one of the many types of dental deformity produced by inherited syphilis; that the nature of the disease, active as it is during the period of tooth formation, may produce an infinite variety of dental abnormalities, any one of which, when associated with disease in other parts of the body, should arouse suspicion when positive evidence of its non-syphilitic origin is lacking.

NOTES ON DENTAL PRACTICE

COMPILED BY WILLIAM D. TRACY, D.D.S.

Management of Post-Operative Pain After Root Filling.—Upon filling the root canals of a tooth which is "sore" at the time, it must be realized that peridental inflammation in some few cases will be increased. Likewise, peridental inflammation may be possible after the removal of a pulp, healthy or infected. Such a thing as one hundred per cent. of success is altogether unknown to us, consequently we are always upon the lookout for trouble and take all precautionary measures to prevent it.

Always relieve the occlusion upon the affected tooth before dismissing the patient from the chair, by slightly grinding its occluding surface or that of the opposing tooth. Give explicit instructions for the use of antiphlogistin that night if there be the slightest soreness in the tooth, and the use of aconite and iodine. Early the next morning we get in touch with the patient, and if there is any appreciable soreness, or pain, an early sitting is insisted upon and a leech is applied, which usually ends the trouble.

If, however, this does not effect a cure, slippery elm poultices within the mouth are applied, and the abscess is either aborted or "comes to a head," as the saying goes; relief is obtained or the tooth is extracted—for occasionally a tooth is lost, notwithstanding our efforts to save it. Of course, when a man has no post-operative trouble, he is not interested in palliative measures, but for those who do meet with pericementitis, not to use leeches—well, one can only be sorry for their patients, that is all.—C. E. KELLS, *Items of Interest*.

Concerning Apical Disease.—As to the question of pictures of blind abscesses, I only want to state again that they are not easily diagnosed from X-ray pictures without considerable study. I mentioned in my paper that darkened areas about the root ends frequently meant no pathological disturbance whatever, and may be due to coagulated lymph brought about by the coagulating influences of drugs used in the treatment of root canals. Then again, many of you have seen pictures of conditions which denoted that a real blind abscess (or at least, a picture of a condition which we comprehend as a blind abscess) had at one time existed, and that the blind abscess is partially again filled with the deposition of new bone, showing that a regenerative process has taken place in the abscess sac without any therapeutic measures having been instituted by the dentist to produce such a change. If you will think that over, that fact will give you a good deal of food for consideration.—TRUMAN W. BROPHY, *Dental Review*.

Manipulation of Synthetic Cements in Cervical Cavities.—Transparent celluloid is peculiarly valuable in condensing a cervical filling. The strip-end is first cut to follow the gum line, very slightly lubricated

with cocoa butter, and then used under a plastic instrument to smooth up the filled cavity. Such accurate marginal definition can be obtained in this way that little or no polishing or dressing down is necessary. Note particularly that the cocoa butter is used only after the cavity has been entirely filled. In only this one instance is cocoa butter necessary on the matrix, for it is manifestly impossible to hold the fitted celluloid strip-end in accurate position for three minutes' hardening time of Synthetic Porcelain.—*The Dental Quarterly*.

Pyorrhea Treatment.—Incipient pyorrhea and some cases of chronic pyorrhea may be successfully arrested and held in check by surgical procedure, followed by systematic prophylactic treatment at frequent intervals, but the teeth should be roentgenographed in our exaggerated cases to note the depth of pockets containing pyogenic membrane and the amount of osseous destruction. If the roentgenogram indicates an extensive dissolution of alveolar process, with a detachment of the pericementum to the apical third of the root, and the affected tooth is so unstable that it requires a splint for its retention, it is a questionable procedure to attempt any treatment and the conservation of such a tooth. We know that teeth in the most advanced stages of the disease can be retained by splints, but we must first consider the physical welfare of the patients and eliminate all oral focal infection.—CARL D. LUCAS, *Journal of the N. D. A.*

Concerning Abscesses.—Any apical abscess, it matters not how small, is a source of danger. So long as vitality is high, the product of a small abscess may do no visible harm, but a slight trauma or a lowered vitality may change seeming immunity into susceptibility to even small dosages of bacteria, or their toxins, with secondary manifestations resulting, often of a very serious nature. If this is true, it is our duty to keep close watch over our patients and eradicate every focus of infection found in the mouth.—THOS. L. GILMER, *Dental Register*.

In Regard to Pyorrhea Instruments.—Those who possess large sets of instruments soon narrow their selection down to a few. Therefore, it is advisable to buy points as needed, in order to avoid carrying a large stock of unused instruments. Some dentists can extract every tooth in the head with two pairs of forceps, while others of equal skill would require at least a dozen changes. So it is in this work—each operator has his favorite points. Some can perform a good pyorrhea operation with half a dozen points, while others may require a hundred instruments. In purchasing instruments, the preference should be given to the universality of use; if you find a point which can be used on several surfaces, it is to be preferred to one which will only work on one surface. Most instruments are too thick; it is a good idea to grind the back of the blade thin. Often old excavators, especially of the spoon shape, can be converted into most excellent pyorrhea instruments.—ROBIN ADAIR, *The Dental Digest*.

Suggestions for the Control of a Difficult Class of Cases.—The most difficult cases we have to contend with are those in which the mucous membrane of the gums and lips is red, inflamed and swollen. The mucous and saliva are thick, ropy and acid. The gums festoon and bleed easily. Cervical cavities appear at the necks of all of the anterior teeth. The cavities are so sensitive that they cannot be excavated. Begin the treatment by using iodoglycerole: zinc iodid, 15 parts; distilled water, 10 parts; iodin crystals, 25 parts; glycerine, 50 parts. Apply this upon the teeth and gums and saturate the cavities of the teeth every day with an applicator for one, two or three weeks, until the cavities cease to be sensitive, the mouth clean, germs are all destroyed and the gums receded to nearly or quite normal. At the same time let the patient use the following gum wash three times each day: Zinc sulphocarbolate, gr. 60; alcohol, oz. 1; distilled water, oz. 2; true oil of wintergreen, gts. 8. The sulphocarbolate was introduced to the profession some years ago by Dr. W. H. Whitslar. There has been nothing placed upon the market that will contract the gums and cleanse the mouth better than this for a gum wash. The gum wash must be applied with a stiff gum massage brush that will reach the festoons between all the teeth. The dentist must watch and direct the patient's movements at least twice a week to see that the work is properly performed, and the gums are pink and hard. At the same time application of iodin must be made as before.—From *Around the Table, Items of Interest.*

Methods of Restoring Partial Loss of Dental Organs.—A partial loss of the dental organs may be restored by one of the three recognized methods, namely—fixed bridge, removable bridge or plate. The fixed bridge has the merits of comparative ease of construction and insertion, and of security of retention. It has the demerits of being the most unsanitary of the three methods, difficult of proper repair when broken, and the most deficient in esthetic possibilities. The removable bridge has the merits of being more easily repaired, less unsanitary and has more esthetic possibilities than the fixed bridge. It has the demerits of being more complicated, consequently requires a higher degree of manipulative ability for its construction, and is also more fragile than the fixed variety. The partial plate has the merits of being the most sanitary of the three methods, of greater simplicity of construction, of greater esthetic possibilities, and is easily repaired.—G. H. WILSON, *Dental Register.*

Requisites for Successful Root Amputations.—The field of operation must be easily seen and inspected; therefore incision to the bone and retraction of the periosteum and overlying tissues is necessary. The outer plate of bone is chiseled away, diseased tissue removed and the cavity made shallow by snipping off and smoothing the bony edges. The root, after amputation, must not project into the surgical cavity at all. If the root canal has been previously filled (I prefer this whenever possible) and other conditions are favorable, the wound can be sutured, after

removing all debris with a saline solution and swabbing with tincture of iodine.—THEODOR BLUM, *Items of Interest*.

Importance of Maintaining Oral Hygiene.—All dental procedures should comply with the requirements of true oral prophylaxis, that is, they should be designed to prevent diseased conditions of the teeth and periodontal tissues. When these requirements are fulfilled for the children of our practices they will have received a benefit of inestimable value and the members of the dental profession will have contributed directly to the health of their clientele and directly to the well-being of their communities. No greater opportunity is open to any profession for the conservation of the health of the individual than is presented to the dental profession today, and particularly is this true in the cases of the children.—GILLETTE HAYDEN, *Journal of N. D. A.*

Important Factors in the Treatment of Pyorrhea.—The “contra-indications” in treatment are many:

1st. If a tooth has no remaining normal attachment it should be removed.

2nd. If a pocket or pockets extend to the apex of a tooth or teeth the pulp is involved—and the root is indented with absorption. This condition contra-indicates treatment and extraction is advised. Operators often excise the end when this condition exists, but the writer's experience in this operation does not encourage him. The per cent. of failures to bring about perfect health about an excised tooth is too great. To ascertain whether osteoclasia has burrowed the root, can usually be determined by delicate but rigid probes, or by the X-ray.

3rd. Antrum involvement. Not infrequently pyorrhea pockets extending to the apex of bicuspid and molars in the superior maxilla result in death of the pulp and subsequently is found abscess of the maxillary sinus. This condition in pyorrhea demands the removal of the tooth, for there has been too long-continued disease to hope for successful treatment.—J. D. PATTERSON, *Journal of N. D. A.*

OUR ARMY AND NAVY

COMPILED BY LELAND BARRETT, D.D.S.

The following recent decisions will be of interest:

Under instructions from Secretary Baker, the adjutant general of the Army has sent the following communication to all division commanders:

1. The number and character of communications coming to this office indicate that widespread efforts are being made to secure, through other than military channels, promotion and other preferment of officers and enlisted men of the National Guard now in the service of the United States. This is in direct violation of paragraph 5, Army Regulations, and of General Orders No. 31, War Department, 1913.

2. You will direct the attention of the officers and enlisted men of your division to the requirements of the regulations, and inform them that it will be necessary to take disciplinary measures in the future whenever these regulations are violated. This should not prevent candidates from submitting applications to division commanders or to the War Department, through official channels, for consideration.

Naval decision:

A properly qualified chief pharmacist mate may be temporarily appointed a dental surgeon with the rank, pay and allowances of lieutenant (junior grade) in accordance with the provisions of the act of May 22, 1917.

The *Army and Navy Register*, on November 3, replied to certain inquiries as follows:

E. C. A.—An officer of the Army Reserve Corps does not wear his uniform until assigned to active duty.

R. R. N.—Pay of a commissioned officer of the Regular Army begins from the date of the acceptance of a commission.

* * *

General Pershing, in a cable to the War Department, says:

I can not too strongly impress upon the War Department the absolute necessity of rigid insistence that all men be thoroughly grounded in schools of soldiers. Salutes should be rendered by both officers and men in most military manner with especial emphasis on rigid position of soldiers in saluting and when at attention. A prompt military salute is often misunderstood by our people, but it simply emphasizes an aggressive attitude of mind and body that marks the true soldier. The loyalty, readiness and alertness indicated by strictest adherence to this principle will immensely increase the pride and fighting spirit of our troops. The slovenly, unmilitary, careless habits that have grown up in peace times in our Army are seriously detrimental to the aggressive attitude that must prevail from highest to lowest in our forces. Strict methods used at West Point, N. Y., in training new cadets in these elementary principles have given the academy its superior excellence. These methods should be applied rigorously and completely in the forces we are now organizing.

* * *

News items, from the *Army and Navy Register*, *Journal of the American Medical Association*, and others.

COLORED MEDICAL OFFICERS' TRAINING CAMP AT FORT DES MOINES

The opening of this medical officers' training camp at Fort Des Moines, Iowa, marked a new departure in the policy of the Medical Department of the

Army. Heretofore, except in a few isolated cases of medical officers in colored National Guard organizations, the colored medical officer did not exist. With the establishment of a colored division of the National Army, the need for trained medical officers became urgent. Already there were 1,200 colored men in training at the reserve officers' training camp for service with the infantry of the National Army. Among these were about thirty physicians. These were later transferred to the medical training camp and commissioned in the medical section of the officers' reserve corps.

With the men transferred from the line camp as a nucleus, the school was started August 27. Soon there were 116 men in training. Of this number, twelve are dentists. These officers come from all sections of the country, as far west as California, as far south as Texas and Louisiana, as far north as Maine, and as far east as Massachusetts.

UNIT OF WOMEN FOR FRANCE

The first unit of women doctors and dentists for service in a base hospital in France, has been equipped by the Women's Hospital, New York, under the direction of Dr. Rosalie Slaughter Morton, president of the Women's Hospital, and Dr. Elizabeth Johnson Van Slyke, superintendent. The members of the unit are: Drs. Dorothy Child and Florence C. Child, both of Philadelphia; Ethel Lyon Heard, Galveston, Texas; Esther L. Blair, Dixmont, Pa.; Esther E. Parker, Cornell, N. Y.; Marion L. Stevens, New York City; G. F. Nevins and Helen L. H. Woodroffe, San Francisco, and DeLan Kinney, New York City, a dentist. Miss Martha Townsend, a graduate nurse of the Women's Hospital, who has served with the Fourth Canadian Contingent at Saloniki and has the rank of lieutenant in the Canadian Army, will accompany the unit, which is now fully equipped and will soon sail for France.

UNITED STATES DENTAL SCHOOL IN PHILADELPHIA

Announcement is made that the Surgeon-General has ordered the establishment in Philadelphia of a school for training in oral surgery and plastic reconstruction of the face and jaws of men who have been maimed in the war. Dr. Wilmer Krusen, director of public health and charities, has agreed to afford facilities in the dental wards of the Philadelphia General Hospital for clinical demonstrations, and has offered his office in city hall for meetings of the teaching board. Dr. Charles R. Turner, dean of the Evans Institute of Dental Surgery, will have charge of the organization of the teaching staff. He will be assisted by Dr. Herman Prinz of the institute in selecting the staff.

Thirty-two advanced students, who are not only practicing physicians and surgeons, but who are at present actively engaged as officers of the Medical and Dental Corps of the Army, have been detailed to Philadelphia for the school. The course will continue during the period of the war. While the University of Pennsylvania Dental School has been designated as the headquarters of the course, some of the branches and laboratory work are being done at the Jefferson Medical College, Jefferson Hospital, Baugh Institute of Anatomy of the Jefferson College, Medico-Chirurgical Hospital, Philadelphia General and the Pennsylvania. The commissioned officers sent to the school from the United States Dental Corps are: surgeons: Major E. J. Johnson, Capts. R. E. Balch, Carl Eggers, A. P. Roope, R. C. Wiggon; Lieuts. Ivan R. Burket, Bernard Friedlaender, S. D. Gleeton, C. W. Hoffman, R. M. Kleckner, F. Koontz, A. J. McCracken, W. H. Maley, J. W. Means, Samuel Oast, Jr., Howard Schriver and E. M. Vaughan. Dental surgeons: Lieuts. Vincent E. D. Bragg, R. S. Catheron, H. O. Cowles, F. H. Cushman, H. T. Hinrici, W. H. Hynard, C. J. Meyer, G. C. Parry, S. D. Ruggles, W. J. Scruten, I. E. Smith, J. D. Stone, C. W. Swing, C. E. Waters, J. B. Williams and P. J. Wumkes.

The following is an abstract of an article entitled "The Dental Profession and the War," which appears in the August issue of the *Dental Record*, of London:

Let us briefly look at the dental organizations of the various armies of the Allies. The Canadians have a very efficient Army Dental Corps comprising a personnel of 2,000, with a colonel as director-general. These include dental surgeons, mechanics, and orderlies. A reasonable number when the small size comparatively of the Canadian contingent is considered. The Australians have a similar arrangement. The French have over 1,000 qualified men, apart from many attached to hospitals. The Americans, with their usual thoroughness and respect for that which will effect economy and increase efficiency, are tackling the problem in an effective manner. The Dental Corps is to form part of the Medical Corps. The present establishment is one dental surgeon per 1,000 men, and it is even proposed to increase this to one per 500 men. Dental surgeons are to be on an entire equality with their medical colleagues and will receive equal rank and status. There is no suggestion that qualified men should be used as combatants. The American does not waste specialized skill like that.

To turn to our own army. We have less than 500 army dental surgeons to look after an army that runs into millions of men. There are 600 or 700 serving as combatants, many as privates.

The loss of effectives, because of lack of proper dental treatment, must run into many thousands. I have been told by R. A. M. C. officers that the recovery from sickness and wounds is in many cases markedly delayed by the presence of oral sepsis, which they are unable to get removed owing to the lack of skilled assistance. I have heard of many instances of rest camps full of men sent down from the line unfit, solely on account of the condition of their mouths. This sort of thing spells waste of man power. One comes across innumerable instances of great suffering borne by men on active service simply because there are not sufficient army dental surgeons to attend to them. Surely simple humanity would prompt the provision of means of relieving the unnecessary suffering of these men, who have quite enough discomfort apart from dental and allied troubles.

Reports circulated by German propagandists of enormous losses sustained by the French and British armies were formally denied recently by Secretary of War Baker in a letter to Senator Saulsbury, of Delaware.

Secretary Baker said that up to June 1 the losses of the British expeditionary forces in deaths in action and deaths from wounds were about 7 per cent of the total of all men sent to France since the beginning of the war, and that the ratio of losses of this character has been considerably reduced since because of the improved methods of attack and the artillery superiority of the Allies.

Senator Saulsbury's letter in part is:

"The pro-German campaign to discourage American patriotism by pessimistic reports regarding the danger to our soldiers in France seems to be very thoroughly organized, and I have been endeavoring to prove the falsity of some of the many statements I have heard regarding the military casualties of the Allies.

"I believe it would be a good thing if the exact percentage could be made public.

"While the Germans furnish for the home consumption of their nationals, official statements covering all matters pertaining to the war in the most favorable way, they have certainly not overlooked in this country, from the reports which I receive, possibility of discouraging citizens of the free countries of the world from encountering dangers in the defense of the rights which are necessary to make life worth living anywhere. The smallest discouragements are with Prussian thoroughness as carefully magnified as the gravest dangers."

* * * * *

General Pershing, on a trip to the front, visited the newly made graves in which lie the bodies of the three victims of the recent trench raid. They are on a green hill, overlooking a small village.

The general showed especial interest in the simple markers upon the graves, recording the name, company and regiment of each of the Americans buried there, and in a wreath of native flowers hung within the inclosure, upon which had been placed, in French, the following inscription:

"Here lie the first soldiers of the great republic of the United States who died on the soil of France for justice and liberty, November 3, 1917."

* * *

Naval Dentists Kept Busy

Base American Flotilla in British Waters, September 30.—Keeping in repair the teeth of the American officers and bluejackets over here is a big task ably performed by two dental surgeons who hold the rank of junior lieutenants, on the two tenders or mother ships now based on this port.

These two men since the arrival of the flotilla in these waters, have treated no less than 1,000 of the personnel of the ships for everything from a common, everyday toothache to a major operation on the molars.

Here, urgent cases are treated immediately, others by appointment and in regular order. The dentists are always "on the job." They are subject to call at any time of the day or night. All work is done at the expense of the Government.

* * *

Suggesting that "it is a very good time for the Chief of Staff and the Secretary of War to wake up to the problem in Europe," the *Army and Navy Register*, in an editorial says:

"It will be a grave error on the part of the Administration if its plans for the continuance of this war with Germany take into account at this time the raising, equipment, training and employment in the trenches in Europe of a military force of less than 5,000,000 men."

Washington, Nov. 17.—The War Department is understood to have virtually decided that the new estimates to be submitted to Congress in December will be based on expenditures necessary to maintain armed forces aggregating 3,000,000 men.

This does not mean that the American Army is to be limited to 3,000,000 men. Every man required to win the war will ultimately be called to the colors by President Wilson.

* * *

It may be of interest to know that the Preparedness League of American Dentists, Metropolitan Unit, is maintaining a dental office at the Navy Recruiting Headquarters, 34 East 23d Street, New York, with Drs. H. W. Pembleton and H. W. Ferguson donating their time and services, with the following results:

	Patients.	Fillings.	Extractions.	Cleanings.
Sept. 30 to Nov. 22 incl..	142	248	149	8

This means that these 142 men were saved to the Navy by this clinic, having passed all the medical requirements first.

* * *

War Department Orders, as follows:

October 20—

DENTAL CORPS

Capt. S. Davis Boak to St. Louis, School of Plastic and Oral Surgery, Washington University, for instruction and return to his proper station.

The following proceed to United States and report to Surgeon General of the Army for duty: Capt. Wm. H. Chambers and 1st Lieut. Albert R. White.

1st Lieut. Chester Denham to Camp Taylor.

1st Lieut. J. C. King from Canal Zone to Surgeon General's office.

DENTAL RESERVE CORPS

1st Lieut. James B. Harrington to Fort Williams for duty.

1st Lieut. Alphonse L. Senecal to Fort McKinley for duty.

1st Lieut. John G. Stack to Fort Andrews for duty.

1st Lieut. John G. Urban to Hawaiian Department for duty.

The following to places indicated for duty: 1st Lieut. Frank K. Garnar to Fort Banks and Leonard E. Powell to Fort Ethan Allen.

The following from St. Louis to Fort Worth, aviation school, for duty: 1st Lieuts. Wendell A. Anthony, Earl N. Henderson and Harold E. Weir.

The following to St. Louis, School of Plastic and Oral Surgery, Washington University, for instruction: 1st Lieuts. Jacob Asch, Stephen H. Campbell, Frederick L. Finnegan, Joshua H. Gaskill, Cyrus C. Jones, Arthur H. Myers, John S. Owens, Leroy Tileston, Marvin V. Welcher, George A. Coleman and Walter H. McCreary.

The following to camps for duty: 1st Lieuts. Albert J. T. Beatty, Camp Gordon, Ga.; Frank A. Cairns, Camp Upton, Long Island; Austin R. Killian and Wm. W. Peet, Camp Grant, Ill.; Raymond G. Shepard, Camp Sherman, Ohio; Weston R. Anderson, Camp Lewis, Wash.; Henry S. Davis, Camp Sherman, Ohio; Lawrence P. Busby, San Antonio, Tex., Camp Kelly; Lee Van Sexton, Louisville, Ky., Camp Taylor, and Benjamin Fiedelbaum, Camp Upton, Long Island.

1st Lieut. S. F. French to Fort Oglethorpe.

1st Lieut. John J. Collins to Camp Grant, Ill., for duty.

1st Lieut. Roy Hudson to Camp Travis, Tex., for duty.

1st Lieut. Harry B. Riley from Camp Meade, Md., to Walter Reed General Hospital for duty.

1st Lieut. Hal N. Orr to St. Louis, School of Plastic and Oral Surgery, Washington University, for instruction and then to Augusta, Ga., Camp Hancock, for duty in the division of plastic and oral surgery.

The following to Camp Kelly, San Antonio, Tex., for duty: 1st Lieuts. Virgil M. Campbell, Fred L. Edele, Wm. P. Katz, Fayette D. Pendleton, Chester B. Parkinson and Charles W. A. Spies.

October 27—

DENTAL RESERVE CORPS

1st Lieut. Edwin T. Foster to Camp Sherman, Ohio, for duty.

1st Lieut. Roscoe C. Funk to Syracuse, N. Y., mobilization camp, for duty.

1st Lieut. George M. Kelly to Camp Dix, N. J., for duty.

1st Lieut. Milzer W. Deist to Camp Grant, Ill., for duty.

1st Lieut. Charles L. Snipes to Fort Douglas for duty.

1st Lieuts. Owen P. Gillick and Harry W. Porter to Camp Devens, Ayer, Mass., for duty.

1st Lieuts. Edward D. Scanlan, Norman E. Gardner and Bryant E. Hazen to Camp Meade, Md., for duty.

1st Lieuts. Oren W. Wallace and Wm. T. Davidson honorably discharged.

1st Lieut. John R. Quinn to Ayer, Mass., Camp Devens, for duty.

1st Lieut. Erwin I. Herzberg to Camp Grant, Ill., for duty with 35th engineers.

1st Lieut. Walter T. Avery to Little Rock, Ark., Camp Pike, for duty.

Assigned active duty Oct. 16: Lieut. C. W. Dowd, Camp Grant; Lieut. W. R. Scanlan, Camp Grant; Lieut. J. J. Lally, Camp Devens; Lieut. John McD. Eveleth, Fort Sam Houston; Lieut. C. W. Raymond, Camp Taylor; Lieut. A. E. Irving, Camp Kearny; Lieut. G. F. Brand, Rantoul, aviation school; Lieut. F. D. Diggs, Camp Greenleaf; Lieut. R. C. Kiebler, Camp Travis; Lieut. F. J. Marshall, Camp Devens; Lieut. W. S. Shuttleworth, Camp Meade; Lieuts. C. B. Hatrick and R. F. Rowdibush to American University camp with 20th engineers; Lieut. H. F. Besse to Camp Devens; Lieut. James M. Adair, Camp Lee; Lieut. Arno L. Brett, Camp Grant; Lieut. Harry W. Everett, Camp Funston; Lieut. Harold C. Gardenier, Camp Dix; Lieut. James M. Gilbert, Camp Gordon; Lieut. Timothy J. Greany, Camp Devens; Lieut. James B. Jones, Camp Gordon; Lieut. Paul B. Lail, Camp Taylor; Lieut. Horace E. Metzner, Camp Custer, and Lieut. Harold A. Tilton, Camp Dix.

Assigned active duty Oct. 17: 1st Lieuts. W. J. Adlington, Camp Devens; Owen I. Bird, Camp Funston; Isaac O. Bishop, Jr., Camp Jackson; Arthur F. England, Camp Lewis; James B. Helton, Camp Gordon; Raymond C. Herman, Camp Dix; Wilbert McKee, Camp Lee; Charles C. Simmer, Camp Custer, and Eugene C. Stamm, Camp Funston.

1st Lieut. J. B. Eby to St. Louis, instruction, then to Camp Sherman.

1st Lieut. G. L. Walker to active duty, report to Southern Department.

1st Lieut. H. A. Wimberly to Camp Kelly.

November 3—

DENTAL CORPS

The following to camps for duty: 1st Lieuts. Leslie D. Baskin, Camp Jackson, S. C.; Leslie S. Harlan, Camp Taylor, Ky.; Henry L. Hogan, Camp Sherman, Ohio; Frederick W. Herms, Camp Fremont, Cal.; Robert B. Strickland, Camp Upton, N. Y.; James E. Dean, Camp Doniphan, Okla.; Wm. T. Williams, Camp Servier, S. C.; Leland S. Wilson, Camp Lewis, Wash., and Walter D. Vail, Camp Pike, Ark.

1st Lieut. Robert H. Mills is entitled to rank, pay and allowances of captain from May 17, 1917.

DENTAL RESERVE CORPS

1st Lieuts. Leonard J. Hitz and William G. Neals to Camp Funston, Kan., for duty.
 1st Lieut. Theodore G. Boyd to Camp Travis, Tex., for duty.
 1st Lieuts. Sturges B. Shields and Frank R. Waite, Jr., to Camp Meade, Md., for duty.
 1st Lieuts. Otis H. McDonald and James E. Johnson to Fort Oglethorpe for duty.
 1st Lieut. John M. McCausland to Fort Myer for duty.
 1st Lieuts. James F. Gildea and Hans C. F. Hille to Camp Dix, N. J., for duty.
 1st Lieut. Harry P. Bachman to West Point, N. Y., Military Academy for duty.
 1st Lieut. Leonard S. Morvay to Syracuse, N. Y., reorganization camp, for duty.
 1st Lieut. George L. Lansdale to Camp Meade, Md., for duty.
 1st Lieut. Albion Nyquist to Battle Creek, Mich., Camp Custer, for duty.
 1st Lieut. Wall M. Billings relieved from active duty.

November 10—

DENTAL CORPS

The following first lieutenants to camps for duty: William B. Caldwell, Camp Sherman, Ohio; James R. Conner, Camp Fremont, Cal.; Jerome L. Fritsche, Camp Dodge, Iowa; Clement J. Gaynor, Camp Funston, Kans.; Wm. H. Hoblitzell, Camp Taylor, Ky.; Hooker O. Lindsey, Camp Beauregard, La.; Neil J. McCallum, Camp Taylor, Ky.; William A. Moore, Camp Funston, Kans.; Harold J. Parker, Camp Upton, N. Y.; Milton A. Price, Camp Grant, Ill.; Fletcher D. Rhodes, Camp Pike, Ark.; Boyd L. Smith, Camp Dodge, Iowa; Francis M. Tench, Camp Upton, N. Y.

1st Lieut. Robert L. Lowry assigned to aviation section at Fairfield, Ohio.

The following to camps for duty: 1st Lieuts. Arthur T. Burchill, Camp Upton, N. Y.; John C. Campbell, Camp Lewis, Wash., and Curtis W. Hallam, Camp Lee, Va.

DENTAL RESERVE CORPS

1st Lieut. Ernest M. Gould to Camp Upton, N. Y., for duty.
 1st Lieut. Clayton A. Patterson to Champaign, Ill., school of military aeronautics, University of Illinois, for duty.
 1st Lieut. Lawrence P. Bushby, Jr., assigned to duty with aviation section, Kelly Field, Texas.
 1st Lieuts. Edward S. Bracken, Jr., and John W. Snyder to 20th Engineers, American University, D. C., for duty.
 1st Lieut. Rea P. McGee to St. Louis, School of Plastic and Oral Surgery, Washington University, for instruction and to his home.
 Following to Philadelphia, School of Plastic and Oral Surgery, Evans Dental Institute, for instruction and return to their homes and relieved from active duty: 1st Lieuts. Robert S. Catheron, Frank H. Cushman, William H. Hynard, Charles E. Waters, Hal O. Cowles, George C. Parry, and Joseph D. Stone.
 1st Lieuts. Paul A. Howell and Orlando J. Johnson relieved from active duty.
 Resignation by 1st Lieut. Edgar A. Creighton accepted.
 1st Lieuts. Edmund F. Lieb and Dan Fulkerson honorably discharged.
 1st Lieut. Troy L. Babcock to Fort Worth, Tex., Camp Bowie, for duty.
 1st Lieut. Hal Nelson Orr to Camp Hancock, Ga., for duty as dental oral surgeon.

The following assigned to aviation section: 1st Lieuts. Joseph L. Brown and John E. O'Flynn, aviation school, San Antonio, Tex.; Jay M. Hisey, Kelly Field, Tex.

The following to Fort Sam Houston for duty: 1st Lieuts. Kenneth C. Pruden, Lee F. Strickler, Thomas F. Montgomery, and Orvis D. Sanders.

1st Lieut. Frederick L. Finnegan to Fort Oglethorpe for duty.

The following to Philadelphia, School of Plastic and Oral Surgery, Evans Dental Institute, for instruction and will return to stations: 1st Lieuts. Vincent E. D. Bragg, Charles J. Meyer, Stewart D. Ruggles, Wilbert J. Scruton, Ivan E. Smith, Charles W. Swing, John B. Williams, and Peter J. Wumkes.

The following to St. Louis, School of Plastic and Oral Surgery, Washington University, for instruction and will return to stations: 1st Lieuts. William A. Baker, Joseph A. Boarts, William P. Delafield, John J. Ogden, Robert H. Nones, Jr., Arthur C. Rohde, George E. Sandoz, Thomas M. Terry.

1st Lieut. Hal Nelson Orr relieved from active duty.

November 24—

The following first lieutenants to camps for duty: George C. Booth and Harry E. Bouden, Camp Upton, N. Y.; Willam W. Peebles and Samuel H. Rosen-

berg, Camp Dix, N. J.; Lucius A. Butler and Frank C. Carter, Camp Meade, Md.; Edward J. Cobb and James L. Crawford, Camp Sherman, Ohio; Thomas B. Davis and Burrell B. Dehaven, Camp Grant, Ill.; Crawford B. Dowdell and Edward C. Jones, Camp Dodge, Iowa.

1st Lieut. Willard J. Worsley relieved from active duty.

The following to Fort D. A. Russell for duty: 1st Lieuts. Munn Q. Cannon and Solomon J. Z. Gantz.

The following to Fort Sam Houston for duty: 1st Lieuts. Raleigh F. Benham, George H. Carberry, John T. Cosler, Louis M. Daum, Douglas D. Godwin and Harry F. Gravelle.

DENTAL CORPS

1st Lieut. George Krakow, now on temporary duty with 35th Engineers, Camp Grant, Ill., assigned to permanent duty with that regiment.

DENTAL RESERVE CORPS

1st Lieut. Albert Mehrer to Fort Slocum for duty.

The following to Chicago, School of Plastic and Oral Surgery, Northwestern University Dental School, for instruction: 1st Lieuts. Jack W. Scherer, James V. Sparks, Frank S. Leonard, Floyd D. Leach, Earl T. Young, Sherman M. Fowler, Max C. Frazier, Donald M. Gallie, Jay H. Lee, Brien B. O'Bannon, Merton M. Postle, John Voss, Everett E. MacGibbon, Walter McN. Morgan, and George D. Siewert.

1st Lieut. Alexander W. McClean to Fort Worth, Camp Bowie, for duty.

1st Lieut. Charles Steffens to School of Plastic and Oral Surgery, Northwestern University Dental School, Chicago, for instruction and return to station. The following to Camp Wheeler, Ga., for duty: 1st Lieuts. Deazil C. Barnhill, Clifton E. Donnell and Ira D. Funkhouser.

THE WAR DEPARTMENT, AND LEGISLATION AFFECTING THE DENTAL CORPS AND THE DENTAL RESERVE CORPS

(Abstracts from *The Army and Navy Register*)

MEDICAL CORPS PROMOTIONS AND DENTAL CORPS

October 20—

The act providing for the promotion of first lieutenants of the medical corps in the Regular Army and National Guard to the grade of captain, and respecting the dental corps of the Army and medical and dental students, was approved by the President on October 5.

The text of the measure follows:

"That during the existing emergency first lieutenants in the Medical Corps of the Regular Army and of the National Guard shall be eligible to promotion as captain upon such examination as may be prescribed by the Secretary of War, and Provided, That hereafter the Dental Corps shall consist of commissioned officers of the same grades and proportionally distributed among such grades as are now or may hereafter be provided by law for the Medical Corps, who shall have the rank, pay, promotion, and allowances of officers of corresponding grades in the Medical Corps, including the right to retirement as in the case of other officers, and there shall be one dental officer for every one thousand of the total strength of the Regular Army, authorized from time to time by law: Provided further, That dental examining and review boards shall consist of one officer of the Medical Corps and two officers of the Dental Corps: And provided further, that immediately following the approval of this Act, all dental surgeons then in active service shall be recommissioned

in the Dental Corps in the grades herein authorized in the order of their seniority and without loss of pay or allowances or of relative rank in the Army. And provided further, That no dental surgeon shall be commissioned who has not been confirmed by the Senate; and provided further, that all regulations concerning the enlistment of medical students in the enlisted reserve corps and their continuance in their college course while subject to call to active service shall apply similarly to dental students."

Senator Pomerene was responsible for the Senate amendment relating to the Dental Corps. Senators Warren and Overman opposed an amendment of the bill in the Senate on the ground that the House would not accept it in the final hours of the session. Both Senators, however, expressed approval of the provisions of the amendment.

Senator Pomerene, among other things, said:

"I do not like to look upon dental surgeons as if they were a separate and distinct profession. It seems to me they are specialists in one branch of surgery, and if we are going to do what is just to the medical profession—and I am glad the committee is seeking to do that—I shall ask at the same time that there be a modicum of justice extended to the dental profession. For that reason I shall offer this amendment if the Senate takes up the bill for consideration."

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ARMY DENTAL CORPS

While the Surgeon General of the Army has discontinued for the present, examination of applicants for the Dental Reserve Corps, two exceptions are made as follows:

First, applications of certain men who are specially well qualified in the management of fractured jaws and oral surgery will be considered.

Second, when a dentist is drafted and has been physically accepted by those in charge of the camp where the dentist has been sent as a private, he may then make application for appointment in the Dental Reserve Corps through the proper channels to the dental surgeon there in charge, who will promptly have completed papers sent to this office for final action, when an additional number of dental officers are required.

Applications already received will be placed on file and the applicants informed when the examination to the Dental Reserve Corps are resumed.

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The following has been sent by the Surgeon General of the Army to camp surgeons: "You will probably find in your camp a certain number of graduate physicians and dentists who have been called under the selective service law and are now on duty as enlisted men. The fact that these professional men have been called to duty under the draft law, does not impair their eligibility for commission. You are authorized to examine such of them as wish to apply for appointment in the Medical Reserve Corps or the Dental Reserve Corps, as the case may be, and if found qualified, to recommend them for appointment. The necessary

blank forms and circulars of instruction will be sent you immediately."

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It is probable that promotions will shortly be opened to the higher grades in the Dental Reserve Corps. As soon as the War Department authorizes these promotions, the Surgeon General will take up the matter with a view of providing promotions for those qualified for same.

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Section 1833, United States Compiled Statutes Annotated (act of March 3, 1911, Chapter 209) creates the Dental Corps. The pertinent part of that act reads as follows:

"Hereafter there shall be attached to the medical department a Dental Corps which shall be composed of dental surgeons and acting dental surgeons, the total number of which shall not exceed the proportion of one for each thousand of the actual enlisted strength of the Army."

It is considered that the factor of service in grade, as a qualification for promotion in the Dental Corps of the Army, has now been removed. Examinations will occur as soon as possible and the promotions will probably create 9 colonels, 16 lieutenant colonels, 71 majors, and 203 captains and first lieutenants.

Many of the dental reservists who have been commissioned during the past four or five months and who have not been assigned to active duty, are expressing a desire to know when they will be ordered to service. In some cases they appear to have anticipated prompt summons to duty and have arranged their professional affairs with that end in view. As has been stated in these columns, there are more than enough dental reservists awaiting duty to fill the 500 vacancies created by the next draft of 500,000 men on the basis of one officer to a thousand men. For the present only, vacancies are filled as they occur and the only appointments made outside of that are to meet extraordinary and special needs of the service. Assignments to duty from the list of inactive dental reservists are made and will be made in no regular order in relation to the date of original commissioning. More depends upon the location of the reservist, his individual qualifications and the place of duty.

* * *

The examinations of candidates for about 100 appointments to the regular Dental Corps held at various Army posts began on November 12. The papers will be sent to Washington for marking by a board which will make recommendations of appointment and which is composed of Major H. E. Johnson and Captains J. R. Bernheim and J. R. Ames.

It will be two or three weeks before it is possible to announce the result of the recent examination for appointment to the regular Dental Corps of the Army. Nearly 400 candidates were examined.

Promotion in the Dental Corps is still held up pending the approval of an opinion of the Judge Advocate General as to whether officers of that branch must serve a stipulated period in each grade before they are advanced in rank.

CURRENT NEWS

Items of professional news, of general interest, will be welcomed by Dr. Meland Barrett, at 220 West Ninety-eighth Street, New York City.

ATTENTION!

TO EVERY AMERICAN DENTIST

President Wilson has asked that every resource for winning the war be utilized to the very limit. The Dental Profession forms one of the greatest resources for making our Army efficient. You are an integral part of this great source of help to your country. Will you meet this responsibility as an American citizen should? Of course you will!

HOW CAN IT BEST BE DONE?

By joining the Preparedness League of American Dentists *now* and assisting in its great work. Ten thousand new members are needed right away. If you are already a member we ask you to get at least five more just as soon as possible. The mouths of the men in our New National Army must be made healthy and dentally fit before they go to cantonments and we must help to the limit of our ability.

The Preparedness League of American Dentists is a recognized agency for carrying on this work under the direction of the Surgeon-General's Office of the War Department, the National Dental Association and the Committee on Dentistry, Sub-Committee of the Council of National Defense.

There are forty-five thousand dentists in the United States. Six thousand belong to the League and have done the major part of the following work: July 16 to November 2, 1917—Fillings, 60,946; extractions, 35,909; cleanings, 2,233; crowns, 133; bridges, 184; plates, 165; unclassified operations, 6,891. Total, 111,061. Thousands of operations not listed were performed prior to and since these dates.

If every one of the 45,000 had done his part, what a splendid showing we could have made. It is not too late to become a part of this great work for increasing the fighting power of our army. We know you are with us.

Don't let the Germans show all the efficiency! Let's show what *we* can do.

For membership send one dollar (\$1.00), payable but once, to the Preparedness League of American Dentists, 131 Allen street, Buffalo, N. Y.

Kindly enclose your business card to avoid mistakes in name and address.

J. W. BEACH, President.

Dentists Authorized to Administer Anesthetics.

An opinion of special interest to dentists throughout Ohio was handed down by Attorney-General McGhee, Friday, at the request of Dr. W. I. Jones of the State Health Council who had requested it to clear up a very general misunderstanding.

In his opinion, Gen. McGhee holds that dentists who hold proper certificates are entitled to administer anesthetics both in the practice of dentistry and otherwise, as occasion may arise.

Some time ago an opinion, which was popularly construed to confine such service to doctors of medicine, was given out.

To quote all the law bearing on the subject, Attorney-General McGhee says; "I advise you that a person who has a certificate to practice dentistry in the State of Ohio is permitted to administer anesthetics, not only in the exclusive practice of dentistry, but also when otherwise properly required to do so.

"In Opinion No. 528, rendered by me on August 14, 1917, I held that the giving of the various drugs to produce anesthesia, when surgical operations are being performed, constitutes the practice of medicine under the provisions of the medical laws of this State and therefore could not be given by persons not admitted to the practice of medicine, but the question raised in this opinion as to the exemption of a dentist was not before me and was not answered in that opinion."—*Dental Items of Interest*, October, 1917.

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Columbia University, on August 1st, issued its prospectus of Advanced Courses in Dentistry for reputable graduate practitioners only, and therein appear many opportunities for advanced work in almost every branch of our science. Many well known members of the profession, both East and Middle West, have allied themselves as professors and instructors, and this augurs well for the future success of the School.

The School of Dentistry, Columbia University, also announced the establishment of a five-year course leading to the degree of B.S., D.D.S., the first two years being taken in the classrooms of the College of Physicians and Surgeons, the program of study being identical with that of the medical students, and the final three years being devoted entirely to dental studies.

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The Committee of Public Safety for the Commonwealth of Pennsylvania, calls most urgent attention to the necessity of preventing overstocking and other forms of waste in the use of perishable drugs, vaccines, etc. Does not this suggest care in the ordering of our everyday supplies, instruments, and so on? Especially in view of the fact that not nearly all our army dentists are yet supplied with their field outfits? "‘Doing Your Bit’ means more than flying the American flag over your store or office. It means enlisting actively in the work of Conserving Life by Eliminating Waste."

Germany is putting 14.3 soldiers into the field for the same amount of money which the United States is paying for a single fighting man, according to calculations today of Government experts. Or in other words, America must raise \$14.30 where the enemy nations raise only \$1 for the purpose of carrying on the war.

The difference is said to be due to the higher pay of United States soldiers and the greater cost of supplies in this country. Resources alone will not win the war; strict economy is necessary.

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Drs. W. J. Mayo and C. M. Mayo, of Rochester, Minn., recently presented a fund of \$1,650,000.00 to the University of Minnesota, for the purpose of medical investigation and research.

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The New York State Department of Health at Albany, N. Y., has in its film library the film "Oral Health," produced by the New York State Dental Society, and slides devoted to the topic of "Oral Hygiene." Dentists interested in these should address Commissioner Herman M. Biggs.

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The Bureau of Education of the Department of Health of New York City has issued a four-page leaflet giving brief and clear suggestions on the care of the mouth and teeth for the employes of the Department of Street Cleaning. The essentials of mouth hygiene are given emphatically, in a nutshell; and Commissioner Fetherston closes with the words: "Don't forget the department physicians and dentist are hired to keep you well."

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The German Government has conscripted Dr. Fisher, an American dentist, who has been practicing in Cologne. The conscription was made under the rule requiring that, under certain conditions, foreign residents in Germany serve in the army.

Dr. Fisher is from Chicago. He has resided in Germany for more than ten years and had decided to continue his practice there during the war.

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On October 2nd, there took place in Boston a most interesting and significant event, the graduation of the first class of Oral Hygienists from the Forsyth Dental Infirmary for Children, this being also the first course of such training available in the State of Massachusetts. It is claimed for this school that the requirements for admission, the duration of the course, and the amount of training required, are of a higher standard than in similar schools in the country. The Director of the School, Dr. Harold DeWitt Cross, stated in his remarks at the exercises that the thirteen graduates had been admitted upon graduation from an approved high school, and had had a thorough course in the theory and practice of prophylaxis, as well as many of the subjects studied by the

dental student, and had devoted a period of twelve months to their studies under a faculty composed of thirty-six men chosen from the foremost ranks of the medical and dental fraternity in that locality.

The purpose of the School is to fit the Oral Hygienist for three fields of work: To act as a dental prophylactic operator, to teach Oral Hygiene in schools and institutions, and to act as an assistant or nurse for the dentist, or in a similar capacity in hospitals and infirmaries.

The program follows:

Dr. H. DeWitt Cross—Opening remarks.

Dr. Victor Safford, of the Municipal Health Department (in the absence of the Mayor).

Franklin B. Dyer, LL.D., Superintendent of the Boston Schools.

Miss Billings, of the Graduating Class, "The Forsyth Hygienist."

Awarding of Diplomas, Thomas Alexander Forsyth, LL.D.

Music and Reception.

Following is the address of Miss Helen M. Billings, of the Graduating Class, entitled "Forsyth Hygienist." Miss Billings said in part:

The Dental Hygienist is the logical outgrowth of the extremely important movement, hygiene. In its entire range is there any phase more valuable than Oral Hygiene?

The oral hygienist is launching upon a new profession, a profession which first took shape fifteen years ago. Although its progress has been slow and its course doubtful, it is now beginning to see success. In a short time she will be as indispensable to the dentist as the trained nurse is to the physician.

Another wide field for the Dental Hygienist is found in the schools. With a dental equipment in a large school one can accomplish much, even single handed, and with an institution such as the Forsyth, efficient team work could be carried on. Clean teeth clubs could be established, tooth brush drills taught, and any amount of enthusiasm stimulated among the children. On the report card, personal hygiene should take its place beside deportment, history and geography.

The first eight weeks of the course which began last October were spent on the dentechs models, with lectures on the use of different instruments. Then we learned something of the fundamentals of sterilization and asepsis, and bacteriology and pathology, with special reference to contagious and communicable diseases.

In the extracting department we received lectures and gained our practical experience in the detail of mixing novocain, technic in the administration of nitrous ovid, the preparation and after care of the patient, and the care of the mouth after extraction.

In the Surgical Department we received instruction three mornings a week in surgery and anesthesia. Each girl worked up from the examining room, the wards, the sterilizing and the etherizing departments, to the operating room. In the sterilizing department the hygienist set up and sterilized all instruments; in the etherizing she was taught to assist the anesthetist and to anesthetize; in the operating room she was sterile nurse to the surgeon in charge.

Every child being treated at the Infirmary visited the Hygiene Room before his appointment. Here, effort was made to teach him why he must have a clean mouth, to make sure his mouth was clean before reaching the dentist, and to teach him the tooth-brush drill.

The hygienist should be of especial advantage to the orthodontist for she has had instruction on the care and in the removal of appliances.

Her work in assisting at the dental chair has been to adjust the chair to the patient's comfort, to put on the bib, to arrange on the table the necessary dental instruments and to mix fillings such as zinc oxid cements and amalgams.

Most important of all has been our clinical work in prophylaxis. We have had patients often in the morning and every afternoon from December until yesterday, while the month of September was given over to adult patients entirely.

Such has been our practical work.

We believe that the ideal hygienist must always be an example of personal hygiene. She is an educator, whether in the dental office or in the schools, and only by living up to what she teaches may she achieve satisfactory results.

The recent meeting of the National Dental Association will go down in history as remarkable in two respects. It was the biggest meeting ever known, over 4,500 having registered, and there was a predominating military tone, both in the character of the papers and the plentiful sprinkling of uniforms, Allied and American.

The papers were of high character and evoked great interest, while the programs as a whole were carried out with but few alterations.

The only adverse criticism heard was the utter impossibility of attending and hearing all the good things, as so many of the Sections held their meetings simultaneously.

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Naturally, the largest meetings in point of attendance, were the general sessions, that of Tuesday morning in the Grand Ball Room of the Hotel Astor, attracting a capacity audience, every seat taken, and many standing. It was at this session the members subscribed for a total of \$18,000.00 for Liberty Bonds, while during the entire meeting enough additional was subscribed to raise the total to \$55,000.00.

At the Tuesday evening session, "after a fine patriotic speech by one of the N. D. A. members, special resolutions addressed to the President of the United States were adopted, pledging our loyalty, professional ability, and lives, if necessary, for the service of our country, in this great war crisis."

The following is the result of the election of officers for the current year 1917-1918, as announced at the New York meeting:

Wm. H. G. Logan, President, Surgeon General's Office, Washington, D. C.

C. Victor Vignes, President-Elect, 830 Canal street, New Orleans, La.

M. E. Vance, First Vice-President, 407-9 Ganter Building, Lincoln, Neb.

Henry A. Kelley, Second Vice-President, 727 Congress street, Portland, Maine.

Clarence J. Grieves, Third Vice-President, 207 W. Madison street, Baltimore, Md.

Otto U. King, General Secretary, Huntington, Ind.

Arthur R. Melendy, Treasurer, Holston National Bank Building, Knoxville, Tenn.

NEW MEMBERS OF BOARD OF TRUSTEES

H. J. Burkhart, Rochester, N. Y.

J. P. Buckley, Chicago, Ill.

Thomas P. Hinman, Atlanta, Ga.

Chicago, Ill., was announced as the choice for the next annual meeting.

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An item of considerable interest to the dental profession was the passage, during September, of the "trading with the enemy" act.

This bill provides authority whereby the President may license Ameri-

can firms to use German patents during the war. It would seem to remove all danger of shortage in the production of novocain, salvarsan, and other drugs of importance to the public and the profession.

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Following is the latest circular issued by the New York Unit of the Preparedness League of American Dentists:

MY DEAR DOCTOR:

If you could win the war for the United States and her Allies by giving one hour of volunteer service each day in your own office, would you give it?

The President of the United States has asked every loyal citizen to give every ounce of help he, or she, can to help win the war.

The mouths of the men in our New National Army must be made healthy and their teeth filled, before they go to their cantonments, and it's your business and mine to see that it's done, and to help to the *limit of our ability*.

The Preparedness League of American Dentists is a recognized agency for carrying on this work, under the direction of the Surgeon General's Office of the War Department. Every dentist in the United States has been asked to give at least one hour of volunteer service each day.

Over 111,000 operations have been performed under this volunteer service, and if every dentist had done his duty, the record would have been 500,000 operations or more. Is the failure for this partly yours?

In the territory covered by the First District Dental Society, 411 dentists have given at least one hour each day (some have given as much as three or four hours each day). Of this number, only 67 are members of the First District Dental Society. Does your name appear as one of the 67!

Think of it, only 67 out of an active membership of 558. This is no way to win the war! We need *your* service and *your* money to help win—and we need it NOW.

We want to see an Honor Roll of our Society, of those members who are giving service. There will be a space on the Roll for the name of every member and there should be *no blanks*.

We must get ready at once for the next draft. Everybody's talking about what ought to be done by somebody and walking right past the thing he might do himself. Are you willing to help?

C. F. ASH, President,

First District Dental Society
of New York.

Surely this appeal will bring results in active moral support, active rendition of *good* dental services for the soldier boys of the next draft, and active financial support of the League and its aims.

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The Liberty Bond salesman of the League's booth at the N. D. A.

meeting, reported subscriptions totalling more than \$30,000.00, principally funds of the First District Dental Society of New York, and the Metropolitan Unit of the League.

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CAMP WADSWORTH

SPARTANBURG, SOUTH CAROLINA

THANKSGIVING MORNING

The 27th Division has started in to make history. On Thanksgiving morning a football game was played between the Dental Corps and the Medical Corps, the former winning by the score of 6 to 0.

This event was momentous for several reasons: It is the first time in the history of the United States Army that the Dental Corps has ever played the Medical; it is the first time that an all-dental team has ever been organized, and it is the first time a representative body of dentists has been able to prove itself superior to an equal number of physicians and surgeons.

The strong right arms of the winners, developed by 50,000 extractions, the eagle eyes, accustomed to detecting the slightest crack in the enamel, found the holes in the medical line and opened up the cracks in their team play; their delicate sense of touch made possible one big touch-down; and their habit of thorough sterilization was undoubtedly responsible for the whitewash that resulted. In fact, they crowned the holiday with victory.

Spider Webb, the lusty full back of the D. C.'s, entangled the attacking life savers in the meshes of his great arms; Dave Warren, the quarter back, like David of old, equipped with his light team, slew the gigantic enemy. Hughes made runs around the end that would have made Charles Evans feel worse than a poor second; Greenwood was as supple as his name implies and did his share against his opponent, big "Black" Smith, by trouncing him at every opportunity; Lane, at end, was always open and allowed the medics to run all around him, Meesk "meesed" his calling and should be wearing the laurels of an all-American half; Boyd helped keep up the spirits of the team, and the necessary scraps during the battle were furnished by two lusty sons of "Auld Erin," Mulcahy and Delaney.

There are sore heads and lame limbs in camp this evening, but there are also many light hearts and full stomachs. Thus endeth the battle.

BOOK REVIEWS

A MANUAL OF DENTAL PROSTHETICS, By GEORGE HENRY WILSON, DDS., Professor of Prosthesis and Metallurgy in the Dental Department of Western Reserve University, Cleveland, Ohio; Special Professor of Prosthesis in the Dental Department of the University Southern California, Los Angeles, Cal. Third and revised ed.; pp. 568; illustrated with 439 engravings. Lea & Febiger, Phila. and New York, 1917; cloth, \$4.50.

A glance at the chapter headings of this practical work-book will indicate the orderly arrangement of the contents: The Mouth; Impressions; Casts; Occlusion and Contour Models; Articulators and Antagonizers; Rubber and Vulcanite; Principles of Retention of Artificial Dentures; Porcelain Teeth; Aluminum and Gold Base Plate; Continuous Gum Dentures, Interdental Splints., etc., etc. "The book is designed for both the busy student and Practitioner," the aim being to present "much in few words."

The treatment of the subject is such that the student may take up his work in a logical way from the fundamental conception of the mouth and the organs of mastication in a state of health, through the many procedures now available for the restoration of those organs when lost or impaired. The chapter devoted to the anatomy of the field, and the mechanism of the masticatory apparatus is clear and satisfactory; the paragraph headings in bold-faced type afford convenient sub-titles to guide the reader. Essential facts are given simply and concisely. Much valuable data is given of plaster and of other impression materials, trays and impression technic. The cast, the bite, and the correct mounting of models are fully considered. The author prefers the term *antagonizer* to articulator; the latter applying properly, he believes, to the simple hinge joint "occlusion frame." Anatomical antagonization is carefully detailed and illustrated.

We have only praise for the clear descriptions of the elaborate details of denture construction, on vulcanite and metal bases. The student can find here the essentials of the art of dental prosthesis. The numerous cuts serve the purpose of illustration effectively; but in some instances are unnecessarily antiquated and stiff. Many figures of instruments and appliances have been familiarly before our eyes in supply house catalogs for a generation, and under the topic of esthetics are given illustrations of Spurzheim's classification of temperaments which, if we mistake not, were borrowed from a hand-book on phrenology which has been widely known for half a century. It is unfortunate to perpetuate these crude specimens of the engraver's art; but they serve a practical turn. Upon the whole, the book accomplishes excellently the purpose for which it is designed.

APPLIED ANATOMY AND ORAL SURGERY FOR DENTAL STUDENTS. By ROBERT H. IVY, M.D., D.D.S., Assistant Surgeon Columbia Hospital, Milwaukee; former Assistant Surgeon, University of Pennsylvania Hospital; former instructor in Oral Surgery, University of Pennsylvania; Second Edition, Thoroughly Revised. 12mo of 290 pages, illustrated. Philadelphia and London: W. T. Saunders Company, 1917. Price, cloth, \$1.75 net.

This compact volume gives the essentials of facial and oral anatomy, surgery and pathology in a way that is very satisfactory for practical purposes. The author states in his preface that it is not his intention to replace larger works, "but rather to indicate to the student the subjects that require his particular attention." The anatomy of the region considered is given clearly and simply, illustrated by photographs and drawings which effectively demonstrate the important parts and their relationships.

In part II., under "General Considerations," are given the leading facts concerning the composition and circulation of the blood, inflammation, contusions and wounds, surgical fever, shock, collapse, anesthesia, instruments and materials in preparation for operation. Under "Special Surgery" are given explicitly the data and principles of treatment of oral conditions under such headings as Tumors, Syphilis, Stomatitis, Alveolar Abscess, Osteomyelitis, Necrosis, Disease of the Maxillary Sinus, Salivary Glands, Tonsils, Lymphatics, Injuries and Diseases of the Temporo Mandibular Articulation, Impacted Teeth, Malformations of the Jaws, Fractures, etc., etc.

We commend this book very cordially as a practical manual for the use not only of the undergraduate student, but for the practitioner who is looking for essential facts, rather than elaborated details in oral surgery.

A MANUAL OF ANATOMY. By HENRY E. RADASCH, M.Sc., M.D., Assistant Professor of Histology and Embryology in the Jefferson Medical College, Philadelphia. Octavo of 489 pages, with 329 illustrations. Philadelphia and London: W. B. Saunders Company. 1917. Cloth, \$3.50 net.

General anatomy is a subject which has been treated so exhaustively—we might almost say magnificently—in recent years that one naturally is struck by the seeming temerity of a new venture in this field. The author of the present work informs us, however, that there is a need for an anatomy of "intermediate" size; and from that point of view the matter and the manner of its presentation in this volume are very commendable. The book is of handy size and the vast subject, though condensed, is given clearly and effectively.

The chapters on osteology, syndesmology, myology, blood-vascular and lymph-vascular systems are well arranged and quite full. Those on the viscera and special organs are relatively brief, but in keeping with the purpose of the book. The preface states: "The anatomy and histology of the nerve system is taken up in a manner different from that used in most anatomies. The external anatomy is continued from one segment to another, uninterruptedly, and the histology is taken up in the same manner. In this way the student has a more connected idea of the parts and their relation to one another. In addition the various pathways are given sep-

arate and rather full consideration, so that impulses may be traced, in a connected manner, from origin to termination. The B. N. A. is given parenthetically throughout the work. The illustrations are numerous and good. This book should be especially valuable to the undergraduate student.

ORAL ROENTGENOLOGY: A Roentgen Study of the Anatomy and Pathology of the Oral Cavity. By KURT H. THOMA, D.M.D., Lecturer on Oral Histology and Pathology and Member of Research Department, Harvard University Dental School; Instructor in Dental Anatomy, Harvard University Medical School; Oral Surgeon, Robert Bent Brigham Hospital, etc.; pp. 205, with 311 illustrations. Boston, Mass., Ritter & Co., 1917.

Dr. Thoma's latest book presents an extensive series of well-executed oral roentgenograms with text matter interspersed which impresses one as running comment on the illustrations rather than as the body of the book itself. The substance of the volume in fact consists in this wealth of illustration, and as most of them are original with the author we are indebted for much valuable and fresh data in a field which is rapidly becoming well known.

Dr. Thoma speaks of the great importance of the X-ray machine to the dental practitioner, adding "but if he would rather rely upon a specialist for taking the roentgenogram he has the advantage of being able to consult a man who has had wide experience and special training in this branch of dentistry." In making this statement it appears to us that Dr. Thoma overlooks the fact that where the operator makes his own roentgen pictures he soon becomes accustomed to resort to their aid whenever needed and consequently becomes expert in reading his own negatives, whereas when it is necessary to send the patient to another office, from that very inconvenience, he limits their use to the few of absolute importance, in the interpretation of which he depends, more or less unconsciously, upon the judgment of another. In other words, the man who does no roentgenography himself, however often he may consult the specialist, never knows much about X-ray interpretation.

Every progressive dental practitioner must be keenly interested in the development of dental roentgenology as supplying almost a sixth sense in diagnosis; hence this book should be in every well regulated office, and should receive careful study. We confess a regret, however, that it was not expanded into a more substantial volume, giving not only the results of special skill, but a thorough demonstration of the practical steps whereby the dentist himself may become a good roentgenologist.

CORRESPONDENCE

THE SEPTIC DENTIST¹

MICHIGAN CITY, IND., November 3, 1917.

To the Editors:

With the Dental Corps endeavoring to secure legislation which will place them on an equal plane with the Medical Corps and the petitioning of the dentists in the States to become associate members of the State medical societies, it seems timely to question the qualifications of the dentists for such a self-extended invitation. Should this catastrophe take place, much speechmaking will have become a miserable waste when there has been such an earnest plea for the higher educational standards and attainments for the regular physician. There is no more reason for a dentist than there is for a chiropractor. If one is so devoted to his specialty, let him take the prescribed standard medical course required by the law and pursue it with the same understanding as a regular practitioner. Dentistry is a specialty of medicine like ophthalmology, proctology, psychiatry, or any other ramification of general medicine or surgery. It is true that the optometrist is still allowed and encouraged to refract eyes, in spite of an unrecognized condition requiring treatment and that the pile doctors, now known as quacks, were the proctologists when the regular practitioner considered this region beneath him, and that the mentally sick were cared for in much the same manner as cattle because the science of medicine had not awakened to the immensity of human suffering occasioned by its neglect and ignorance of chemical dyscrasæ.

The same is true in this age of the glaring deficiency manifested in the dental specialty. The practice of dentistry is not a profession but a trade. The preliminary of a dental student is most inadequate; he is required to go through the form of an entrance examination which is regarded even by the applicant as camouflage. It is well known that the majority of dentists have a very meagre preliminary education; in many instances the seventh grammar grade is the limit. The three-year college course is well occupied in mechanics, with a trace of anatomy and lesser amounts of the other essentials. An orthopedic surgeon requires a skilled mechanic to perform the blacksmith's duties in connection with this specialty, yet the mechanic is not entitled to a degree of doctor unless qualified in the prescribed manner. Being a victim of the dentist's trade, and not an occasional visitor, I have yet to see an instrument sterilizer, a scrub brush for aseptic purposes, or disinfecting solutions for the hands, even after the treatment of a patient with pyorrhea. This septic process is too frequently the etiology of pyorrhea in our robust patients who have no other assignable reason for this dreaded malady. Neither have I seen a

¹ Reprinted, by permission, from New York Medical Journal, Nov. 17, 1917. See editorial, p. 500.

laboratory outfit for the occasional examination of a slide or a small X-ray cabinet which is proving the handiwork of our septic dentists. It has been my embarrassing position to ask more than one dentist to wash his hands before examining my mouth, and yet how I wished that I might ask him to scrub and go through the solutions in the same manner as a surgeon. And why not? If it were not for the natural defense reaction of the oral secretions, the practice of dentistry would be as hopeless as was the practice of surgery before the day of Pasteur and Lister. Without thorough hand disinfection, the septic dentist can easily pass from one house to another the organisms of pneumonia, tuberculosis, pyorrhea, and typhoid, and the no less deadly specific infections.

Not only is there the gross lack of asepsis in the large majority of dentists' offices, but there is also a great necessity for the appreciation for minute microscopy. I have seen an occasional instrument run through some patent solution and then relieved of a bit of cotton or accidental dirt by a brush on the back of the septic hand, the instrument to be used later in possibly a sterile cavity. Not long ago I was entertained at a medical meeting by a professor in dentistry in a state dental college, who during the course of his lecture persistently spoke of "empyemia" and further enlightened the conference by explaining that a great deal too much was made of systemic infection due to pyorrhea, that the general practitioner was too much inclined to attribute gastritis to this source as well as the joint affections, and that the pyorrheal discharge was greatly maligned. So far as making a night call is concerned, many dentists feel almost outraged if asked to make a house visit or even open the office for an emergency case. This is particularly true on Sundays and holidays. When a general surgeon undertakes a case he stands ready to be responsible for the anesthetist and all assistants, but when a dentist undertakes a case in which a general anesthetic is required we all know that the operating dentist is not responsible for the work done by the anesthetist.

I have asked numerous dentists why they did not lay a foundation with a four-year medical course which would especially fit them for bacteriological research and the great advantages to be gained with an acquaintanceship with surgical asepsis and diagnosis. Invariably the reply was that it would take too long before they could begin to practise and that they needed the money. Differential diagnosis and follow up treatment are as necessary to the practice of dentistry as they are to the general practice of medicine. Anemia preceding the extraction of teeth seems to be as inconsequential to the dental practitioner as is the anemia following a severe hemorrhage, whether due to hemophilia, scorbutus, or some other blood dyscrasia; this neglect is not intentional, but is due to absolute ignorance of allied metabolism. A word to a patient to see the family physician is not necessary to the well to do, while to a poor patient the advice is superfluous, for he has not the means to care for that which seems to him a trivial matter. If dentists understood more of general

medicine a patient with a heart lesion would not be turned loose to wander home immediately following the use of cocaine or some similar drug. Not being able to diagnose heart lesions, they have no more right to be dispensing these chemicals than a nurse has administering an anesthetic. Hysterectomies are not performed by persons who have done no other medical or surgical work than just this specialty; the same is true of herniotomies, splenectomies, etc. No specialty is gained in the time spent at college acquiring the fundamentals, except the specialty of dentistry. The other specialties require a lifetime. It is for these reasons and many more too numerous to mention that the medical profession should hold high its noble domain and repel any intruder who would unlawfully accept any of its excellent benefits, even though they be thrust at him.

ROSE ALEXANDER BOWERS, M.D.

OBITUARY

DR. J. F. P. HODSON

With deep regret we announce the passing away of Dr. J. F. P. Hodson, in New York City on November 8, 1917. For half a century Dr. Hodson had been well known in his profession as an operator of unusual skill and ingenuity, always interested and active in the advancement of dental science, prominent as a member of the First District Dental Society of New York and of the New York Odontological Society; and until the end, Trustee of the New York College of Dentistry. A sketch of Dr. Hodson's life and work will appear in the next issue of THE JOURNAL.

DR. WILLIAM A. WHITE

Died at Phelps, New York, on October 15, 1917, William A. White.

Dr. White, who was in his sixtieth year, was born in Albany September 14, 1857, and had lived in Phelps for the last 36 years. He graduated from the Baltimore Dental College in 1881 and since then had practised his profession in Phelps.

In April, 1883, he married Miss Fannie Frazier, who with two children, Mrs. George B. Nelson of Chicago and Harry White of San Diego, Cal., survive.

Dr. White always took an active interest in matters pertaining to the welfare of his home town as well as to his profession. During his career he had held the office of president of the Seventh District Dental Society, and of the New York State Dental Association and at the time of his death held the chair of histology on the State Board of Dental Examiners.

For three years he was associated with the New York State Department of Health as consultant and lecturer, during which time he lectured extensively throughout the state before schools and various organizations on oral hygiene.

Dr. White also served five years as a member of the Board of Education of the Phelps High School, was a member of the Presbyterian Church and prominent in its work.

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